COLONY OF MAURITIUS

Annual Report

OF THE

Department of Agriculture

for the year 1963

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PORT LOUIS, MAURITIUS
MARCH 1965

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DEPARTMENT OF AGRICULTURE,

REDUIT.

15th October, 1964.

SIR,

I have the honour to submit the Annual Report of the Department of Agriculture for the year 1963.

I have the honour to be,

Sir,

Your obedient servant,

M. D. FFRENCH-MULLEN,
Director of Agriculture.

THE HONOURABLE THE MINISTER OF AGRICULTURE AND NATURAL RESOURCES,
Ministry of Agriculture and Natural Resources,
Port Louis.

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Annual Report of the Department of Agriculture for the year 1963

I. General Review

During 1963, there was no important change in the policy of the Department of Agriculture. It continued to centre round the maximum utilization of the land and water resources of Mauritius and its dependencies. With a view to increasing the limited amount of water available for irrigation as well as increasing the efficiency of land utilization, an application was submitted to the United Nations Special Fund for a survey of the land and water resources of Mauritius. Owing to the limited resources of land suitable for agriculture, the majority of which is already under cultivation, emphasis was placed on increasing the productivity of the cultivated land as well as on the utilization of all the relatively small reserves of undeveloped land in the uplands under tea. The development of the livestock industry received considerable attention, particularly the production of milk, meat and poultry.

2. Weather conditions were generally normal during the first half of the year while, in the second half, rainfall tended to be less than usual and temperatures lower than customary. At the end of the year, dry conditions prevailed and interfered with crop growth in areas where irrigation was unavailable. As a result of these conditions a record sugar crop was harvested of 685,523 metric tons which exceeded the previous record in 1959 by some 105,000 metric tons. Tea production increased, due to favourable weather conditions and to increased acreage coming into bearing. The production of Virginia tobacco was well above the quota, in large measure due to favourable weather conditions. Foodcrop and vegetable production was similar to 1962. The increase in the production of Irish potatoes of 1,200 tons compared with 1962 was satisfactory.

3. The Department was organised into 13 divisions consisting of 314 officers including a Director and two Deputy Directors who plan and carry out the experimental, development and extension work of the Department. Assistance was also received from the Food and Agricultural Organisation of the United Nations who provided a Rural Institutions Officer and a Marketing Adviser to assist in the in-service training of extension staff and in the setting up and organisation of an Agricultural Marketing Board respectively. The Canadian Government also made available the services of a Fisheries Adviser to assist in the development of the Fisheries of Mauritius and its dependencies.

4. The work of the Department is broadly divided into:—

(b) extension, to advise and assist farmers with a view to their obtaining livestock in the various environmental conditions obtaining in Mauritius;

(b) extension, to advise and assist farmers with a view to their obtaining the maximum productivity and economic returns from their farms.

5. The development of agricultural industries other than sugar and the provision of an extension service to small sugar-cane planters continued to be the main concern of the Department. Encouragement and assistance were given in the production of tea, tobacco, pasture and forage crops, orchard crops, foodcrops and vegetables, livestock and livestock products. The " Grow More Food " Campaign was continued in 13 villages.

6. The majority of the technical officers of the Department received their initial training in agriculture from the College of Agriculture, which functions as a division of the Department. Professional and specialist staff generally complete their training overseas. The College also provides technical staff to the sugar industry, other agricultural industries and the Mauritius Sugar Industry Research Institute. The College continued to offer two 3-year courses leading to diplomas in agriculture and sugar technology. 57 candidates applied for admission to the diploma courses: of these 15 passed the entrance examination and were enrolled, 9 in agriculture and 6 in sugar technology. During 1963, there were 79 students in residence, of whom 47 were taking the diploma courses. The last group of students taking the old diploma course sat for their finals and all 13 students passed, 2 of whom obtained the Honours Diploma. During the year, Professor C. T. Leys of Makerere College, University of East Africa, visited the College in order to study the possibility of setting up a University College in Mauritius.

7. The Department has maintained the essential services which it continues to provide for the sugar industry, namely the Sugar Millers and Planters Central Arbitration and Control Board, which regulates the sale and purchase of canes and the extension service to small planters. Some 22,939 tests were carried out by the Board on planters' and estates' canes. 29 protests were received in respect of the provisional assessment of sugar for the 1963 crop. Cost of production questionnaires were issued and a schedule of rates of transport costs for sugar-cane was issued. There was no alteration in the delimitation of factory areas. 1,384 cane contracts were registered and complaints against middlemen and prosecutions for breaches of the Sale of Cane Control Ordinance were dealt with.

8. 193,000 arpents of cane were harvested, out of a total acreage of 205,000 arpents. A record crop of 685,523 metric tons of sugar was produced, of which 565,205 long tons were exported. 351,750 long tons of the sugar exported were sold under the Commonwealth Sugar Agreement at the negotiated price of £41.0.10d per ton, the remaining 213,455 long tons being sold on the free market. Four varieties of sugar-cane, namely M 147/44, E 1/37, B 37172 and M 34/52 accounted for about 68 per cent of the acreage under sugar-cane, the remaining 32 per cent comprising the following varieties in their order of importance: — M 202/46, B 3337, M 93/48, E 50/47, M 31/45, B 34/104 and M 253/48.

9. The Department continued to direct the activities of the 3 committees administering the Sugar Industry Rehabilitation Funds. The Sugar Planters Rehabilitation Fund continued to manage the Small Planters Mechanical Pool, which is designed to clear and destone land planted under sugar-cane and to operate the Pointe aux Sables Cane Nursery for the production of disease-free planting material for small cane planters. The acreage of the cane

nurseries was further expanded during the year and the present acreage, when fully developed, should be sufficient to supply the demands for planting material in the foreseeable future. Negotiations were completed with the Mauritius Sugar Producers Association for the expansion of the activities of the nursery by the setting up, in various factory areas throughout the island, of subsidiary nurseries to supply disease-free planting material to the industry.

10. The tea industry is controlled by the Tea Control Board under the chairmanship of the Director of Agriculture. During the year, the Board was mainly concerned with the improvement in the standard of manufacture, the sharing of the local market between the various manufacturers and the promotion of the consumption of Mauritian tea. A " Drink More Tea " Campaign was launched. Mauritian tea was represented at the Madagascar Trade Fair through the courtesy of the Ministry of Industry, Commerce and External Communications and outlets for tea in South Africa and Australia were explored.

11. Of the 5,374 arpents planted to tea, approximately 2,500 arpents are mature plantations and 2,000 arpents are in partial bearing. There are 429 plantations, varying in average size from 2.14 arpents to 292.57 arpents. Farms of less than 5 arpents comprise 14.8 per cent of the total area under tea, 5 to 25 arpents, 4.7 per cent, 25 to 100 arpents, 20.6 per cent and above 100 arpents, 59.9 per cent. The largest plantation under single management was 837 arpents and there were 70 plantations of less than 1 arpent. Climatic conditions were generally favourable to leaf production which, coupled with increasing acreage coming into bearing, resulted in a record production of 3,256,891 lbs of black tea, an increase of 447,857 lbs over the previous record in 1961. Of this production, approximately one-third was consumed locally. The price realised for tea exported to London has shown a definite drop during the year under review. The average price received for 16,837 chests exported was 3s.5.81d. per lb compared with 3s.11.2d per lb in 1962. All tea factories were in operation throughout the year, save for that at Marc Anguilles. One factory commenced a major reconstruction and development programme and manufacturing facilities were improved in two other factories by the installation of withering troughs. The planning of the extension of the Chartreuse Tea Factory was completed with a view to raising the capacity of the factory from three-quarters of a million to one and a half million pounds of made tea per crop year.

12. Following representations from participating planters in the original Tea Development Project, which was commenced in 1956 and which was due for completion in the middle of the year, the scheme was extended for a further two years on the grounds of the setbacks suffered from cyclones since 1960. A fresh impetus was given to the development of the holdings contained in the scheme as a result of the decision of the Agricultural Bank to increase the rate of loan for tea planted under this scheme prior to 1961. Of the 3,000 acres to be developed under this scheme, 1,908 acres were under tea by the close of the year. 134 acres of the 289 acres under this scheme, developed by Government, were divided into 33 small holdings of approximately 4 acres each and were leased to farmers in the middle of the year.

13. Work has proceeded satisfactorily on the new Tea Development Project which envisages the establishment and planting of a minimum of 500 acres of tea per annum by Government for distribution, when fully established, as small holdings. Weather conditions hampered land clearing operations in the first half of the year but, in spite of this, progress was satisfactory and, at the end of the year, 1,280 acres were contour- surveyed, 1,090 acres cleared, 650 acres prepared for planting and 615 acres planted.

14. The local production of tea seed, to meet the development requirement, continued to be unsatisfactory, mainly due to climatic conditions and the unsuitability of certain of the tea seed gardens. 9,750 lbs were harvested, mainly from one garden. In consequence 19,750 lbs of tea seed had to be imported from East and Central Africa.

15. The Managing Agency Agreement between Government and Nuwara Eliya Tea Estates Co. (Mauritius) Ltd. for the operation of Chartreuse Factory and Midlands Tea Estate expired on the 31st of March. A new Managing Agency Agreement was entered into between Government and the La Chartreuse Tea Marketing Co-operative Society Ltd. This society is composed of planters producing tea on Crown Land under the original Tea Development Project which was commenced in 1956. The new agreement is for a period of 2 years, during which time the Managing Agents have the option to purchase Chartreuse Tea Factory.

16. The control of the tobacco industry continued to be vested in the Tobacco Board which not only purchases, processes and stores all leaf produced, but provides an extension service to the industry. The research services are provided by the Department of Agriculture, which is also responsible for the production of seed of all approved varieties. The seed stocks held by the Department are sufficient for two years' usings as an insurance against natural disasters. Weather conditions were generally favourable for the production of flue-cured Virginia and air-cured Amarello tobaccos. The yield of leaf and the financial return to growers were higher than in the previous year and, in the case of Virginia, were the highest on record. Similarly the quality of Virginia tobacco received in the warehouse was higher than in previous years. Owing to the large stocks of flue-cured Amarello tobacco in store and the fact that demand for this tobacco has fallen off, no permits for the production of this tobacco were issued in 1963. Permits for an increased acreage for both flue-cured Virginia and air-cured Amarello tobaccos were issued. Owing to favourable climatic conditions, there was an over-production of flue-cured Virginia as well as air-cured Amarello and Burley. 483 tons of tobacco of all types were produced from 784 arpents compared with 372 tons from 681 arpents in 1962. Usings of domestic leaf by both manufacturers increased by 7.8 per cent while the usings of imported leaf decreased by 11.4 per cent. Purchase prices remained unaltered.

17. The Mauritius Hemp Producers Syndicate continued to control the marketing of aloe fibre, which was processed into sacks by the Government Sack Factory for use by the sugar industry which is, for practical purposes, the sole consumer. 1,349 metric tons of aloe fibre were purchased by the

factory, an increase of 50 metric tons on the 1962 deliveries. 794,597 pure aloe sacks were produced as well as 705,524 sacks containing a mixture of aloe fibre and imported jute. In addition to the above two types of sacks, a further 34,383 sacks were produced together with 27,990 yards of filter press cloth, 1,745 yards of other fabrics, rope and yarn. The cost of production of these sacks was higher than the cost of imported jute sacks with the result that the Government Sack Factory operated at a loss amounting to Rs 569,951 compared with a loss of Rs 496,412 in the previous year. Prices of aloe fibre remained the same as in the previous year while jute cuttings, which were purchased in two consignments, first rose above the price paid in the previous year and then fell below it, which prices are considerably below the average price paid for aloe fibre.

18. The programme of progeny testing of bulls of the creole breed was continued but on a reduced scale. During the year, it was decided that the improvement of milk yield in the creole breed, using the progeny testing technique, would not result in a rapid increase in milk production. As there is an urgent need for a rapid increase in liquid milk production, it was decided that, once the necessary records were devised following the cattle census, cowkeepers should be given the opportunity of utilising the higher liquid milk production potential in the tropics of grade Friesian cattle. With this aim in view, a preliminary introduction of six Friesian bulls was made from Australia. The production of selected breeds of herd cattle, pigs, goats, poultry and rabbits continued for sale to producers as well as for experimental work. The Boran cattle at Palmar continued to show promise and four bulls were sold to breeders. Two were sent to Rodrigues to determine their effect on improving the beef qualities of the herd cattle on that island. The Artificial Insemination Service for the dairy industry was maintained, some 11,430 inseminations being undertaken. There was no demand for young breeding stock of the large white breed of pigs. The Anglo-Nubian goats continued to show promise while the production of the British Alpine goats was suspended, as this breed does not show promise under local conditions. The trial of four breeds of rabbit continued at Curepipe and was extended to Reduit during the year. The poultry breeding programme for White Leghorn, Rhode Island Red, Light Sussex and White Rock was maintained and the ' 404 ' parent stock imported in 1962 were mated. The ' 404 ' breed has become very popular, some 6,805 day-old and month old pullets were distributed to poultry keepers, together with 2,994 day-old cockerels for broiler production. In addition, the production of day-old broiler chicks from White Rock, Light Sussex, Rhode Island Red stock increased both for use at the Poultry Centre and for sale to broiler producers, the latter purchasing 10,861 from the Centre. Egg production as well as the reproductive performance of birds at the Poultry Centre continued to compare favourably with results obtained overseas. Preliminary results from the Broad Breasted Bronze turkeys, imported in 1962, were very satisfactory.

19. The demand for the products of the Livestock Feed Factory continued. 4,092 tons of feeds were manufactured, 14 types of feed being offered by the factory.

20. The health of livestock at the various livestock and agricultural stations was satisfactory. No major diseases were recorded in cattle, goats and pigs while in poultry, the major diseases affecting stock were neural and visceral lymphomatosis. Avian Encephalomyelitis was recorded amongst chicks and blood serum samples were negative for Infectious Bronchitis. Coccidiosis in poultry was effectively controlled by a coccidiostat while in rabbits, sulphur drugs gave efficient control. The Animal Health Laboratory was inaugurated in February. 2,219 post-mortem examinations were carried out in the laboratory, which continued to produce live and inactivated Newcastle Disease vaccines together with Fowl Pox and Canine Distemper vaccines. The Animal Quarantine Station at Fort William was transferred to Roche Bois and the Fort George Station will be transferred to Roche Bois as soon as the development of the latter station is completed. 823 import permits for livestock and livestock products were issued, together with 582 landing permits. 5,185 head of cattle passed through the quarantine station for slaughter. Owing to shortage of staff the tuberculin testing of cattle was handicapped, only 473 head of cattle were tested, resulting in 6.9 per cent reactors among herd cattle and 2 per cent among milch cattle. Weekly returns introduced at all slaughter houses as from the beginning of the year have proved invaluable for the compilation of slaughter data.

21. In land settlements, settlers' holdings were farmed satisfactorily. There appeared to be a gradual improvement in their standard of farming. In many settlements, the foodcrop area was not fully utilised and tenants again renewed their request that they should be allowed to crop their foodcrop areas under sugar-cane. During the year, Government approved the reduction by half of the arrears of rent for the years 1960 and 1961 as well as reduced by half the rental of foodcrop areas in land settlements. In spite of these reductions, rent collection was again unsatisfactory.

22. The extension services were again mainly concerned with improved crop husbandry to ensure better yields and higher incomes to small farmers. The rational use of fertilizers, control of pests and diseases, the use of improved varieties of crops and soil conservation measures were the main agricultural issues on which advice was tendered to farmers and some 9,223 field visits were made. Close liaison was maintained between the extension services and the Mauritius Sugar Industry Research Institute as well as the specialist officers of the Department of Agriculture. 51 fertilizer demonstrations were carried out on farms, both on sugar-cane and foodcrops. A few weedicide demonstrations were laid down in the fields of some cane growers who were anxious to eradicate specific weeds from their cane fields. 230 demonstrations on the control of pests and diseases were conducted on farmers' crops and 146 evening meetings of small farmers were convened at which lectures on various agricultural topics were delivered, agricultural problems discussed and leaflets distributed. Throughout the year, a special effort has been made to persuade small cane farmers to use fertilizers and disease-free planting material with a view to raising the yields of small cane farmers to nearer the average for the island.

23. The main disease affecting tomatoes and potatoes were bacterial wilt and late blight, the latter proved difficult to control during the early winter months on account of wet weather. The dry weather prevalent in the latter

half of the year resulted in increased activity by insect pests, particularly fruit flies, caterpillars, aphids and mites. A severe outbreak of *Plusia* sp. and *Prodenia* sp. resulted in heavy damage to potato crops in the north; the mobile spraying unit proved invaluable in effecting control. Severe localised outbreaks of locusts were recorded on sugar-cane in the districts of Rivière du Rempart, Flacq and Plaines Wilhems which were controlled by the use of the mobile spraying unit applying aldrin and dieldrin. A total of 155 arpents of cane were sprayed under the direct supervision of the extension services.

24. The subsidisation of certified potato seed continued to encourage the production of potatoes and a large acreage of cane inter-rows was devoted to this crop. Under this scheme, 1,556 permits were issued to small farmers and 715 tons of certified seed potatoes were allocated. Approximately 350 arpents of land, on which planters proposed to grow potatoes, were visited prior to delivery of permits and following delivery, to ascertain that the seeds had been planted. Yields were better than last year and the scheme has undoubtedly contributed to a regular supply of potatoes on the local market at reasonable prices. 122 arpents of potatoes were sprayed by the mobile spraying unit against blight. The large scale demonstrations by this spraying unit, which have continued during the year, have contributed to the farmers' awareness of the value of the preventive spraying of potatoes against the pests and diseases and have led to an encouraging number of farmers purchasing their own sprayers.

25. The six demonstration plots at district headquarters were maintained satisfactorily and continued to supply a wide range of planting material of both food and forage crops to meet increasing demands. Vegetables were also grown from acclimatised seed to demonstrate to planters cultivation techniques and the varieties of vegetables available. A limited amount of disease-free cane material, of recommended varieties, was also made available to planters from these stations. The citrus, litchi and coconut orchards at Plaisance continued to make excellent progress.

26. With the agreement of the Ministry of Education, gardening activities in a limited number of schools were resumed by the extension services. 14 schools were selected and, by the end of the year, the gardens of these schools were being run satisfactorily.

27. The " Grow More Food " Campaign was continued and operated in 13 villages. The Village Committees met at regular intervals and weekly visits were paid by the Extension Officers concerned. More than 800 fruit trees were planted and over 1,400 chicks were distributed as well as planting material of food and forage crops. 20 kitchen gardens were run with the help and advice of the Extension Officers and satisfactory progress was achieved by all villages.

28. Estimated foodcrop production for the island amounted to 37,100 metric tons, compared with 38,000 metric tons in 1962. There was a total increase of 1,200 tons in the production of Irish potatoes. This increase is undoubtedly partly due to the certified seed potato scheme and the intensive extension encouragement given to small farmers on pest and disease control and the use of fertilizers.

29. The 14 demonstration pit silos which were filled in 1962, on opening, gave silage of reasonable quality. There are signs that cowkeepers in certain localities are showing an increasing interest in feeding ensiled cane tops to their stock. The pits were refilled towards the end of the year.

30. Experimental work on the various stations was carried out as planned. At Curepipe station, the arable acreage was increased by the reclamation of 1½ acres of scrub land. The testing of introduced grasses and legumes continued and some of the introductions showed promise. Statistical experiments were laid down on the main forage grasses and again demonstrated the superiority of the locally selected strain of *Setaria sphacelata*. The orchard crops continued to make progress following repeated damage by recent cyclones. Two strains of coffee were planted for observation trials; the imported raspberry varieties did not flower. Variety, spacing and fertilizer trials were laid down on *Colocasia esculenta*, beans, potatoes, maize and cauliflowers, and demonstration areas of various vegetables were planted. Two imported potato varieties proved more resistant to blight than King George and Kennebec while the variety Delaware was the most susceptible. Split application of nitrogen on maize proved superior to a single application at planting.

31. Fish ponds stocked, in February 1962, yielded in December, 1963, 961 kgs of fish, of which 447 kgs were of marketable size. *Catla Catla* fry received from India in September, 1961, were found to weigh just over 2 kgs towards the end of 1963, a very creditable result.

32. At Reduit, the clearing and development of an additional 10 acres of land acquired from Le Reduit grounds for the expansion of the station was commenced. This acquisition will permit the use of part of the station for practical work by the students of the College of Agriculture. Experimental work continued on citrus and other orchard crops as well as on grasses and legumes. A fertilizer trial with Pangola grass, with standard dressings of phosphate of potash, indicated satisfactory yields of grass with increasing applications of nitrogen. A yield of 31.7 tons per arpent of forage was obtained with nitrogen dressings of 400 lbs. Experiments with hybrid maize indicated their superiority over local maize. Two introduced varieties of groundnuts, Makulu red and Manipintar proved superior to the local variety Cabri, yields being over 50 per cent greater.

33. The arable acreage at Barkly station was increased by 8 acres and, at the end of the year, this area was being cleared and prepared for cropping. This station is the centre of seed production and controls the seed producing acreages on other stations. A total of 48 acres was devoted to seed production, the greater part of which was at Barkly station. Revenue from seeds and plants increased by Rs 14,000 compared with 1962. Production of budded citrus continued. 3,669 budded citrus plants were produced and 1,926 budded orange plants, produced in the previous year, were sold. The propagation of citrus was restricted towards the end of the year because of a shortage of budwood. The citrus orchard at Plaisance made exceptional progress while others at Reduit, Barkly and Richelieu were satisfactory. On

account of cyclones, there was again a shortage of mango seedlings for propagation purposes. 5,000 Malayan dwarf coconuts of 3 strains were imported for the establishment of departmental groves and sale to the public. 2,200 litchi layers were prepared and 1,890 were sold. The introduced grape variety of Napoleon Chasselas from Reunion continued to produce good grapes of good eating quality at Abercrombie Nursery and the new mango orchard at this nursery continued to progress satisfactorily and will in time yield a supply of much needed budwood of high quality mangoes.

34. At Richelieu Station, work commenced on the reclamation of the remaining unutilised 40 acres of the station. Irrigation water for this area will be obtained from the La Ferme distributory canal. This station continued to produce the tobacco seed requirements of the country and together with Pamplemousses station provided the facilities for the applied research work on tobacco. Trials with nematocides continued, methyl bromide having the additional advantages of controlling weeds in nursery beds, as well as permitting the sowing of seed within 48 hours of treatment. The practice of planting additional seed beds with the commercial varieties of tobacco was continued as an insurance against loss of seed beds by planters through cyclones. Seed production was maintained with a view to holding two years' supply of seed of commercial varieties in case of natural disasters. The varieties of Yellow Mammoth and Bonanza remained the principal flue-cured Virginia varieties planted on a commercial scale. Three new varieties, namely Vesta 30, NC. 73 and Cokers 187 were tried out by commercial growers; Burley again giving disappointing results, possibly due to weather conditions. Certain of the introduced varieties of flue-cured tobacco showed considerable resistance to soil diseases. Variety and fertilizer trials were carried out as well as the testing of insecticides. Trials were carried out on the steam curing of tobacco with satisfactory results; a superior product was obtained from steam curing compared with standard flue-curing. However, it is unlikely that steam curing will be economical if installed in the smaller barns in existence in Mauritius. 3,377 kgs of flue-cured tobacco were produced, from 7½ acres of experimental fields at Richelieu and Pamplemousses, giving an average yield of 990 lbs per acre with a gross value of Rs 22,506. In addition to the tobacco work, experiments were carried out on potatoes. At Richelieu, the potato variety Delaware gave a significantly better yield than the standard variety King George. Experiments were also conducted on maize for both seed and silage as well as on vegetable crops and beans. 510 tons of canes were harvested from the rotational experiment giving an average yield of 32 tons per acre. The mango, citrus and litchi orchards continued to make satisfactory progress. Difficulties were encountered in the fish ponds, farmed in association with a piggery and cowbyre, due to seepage.

35. A complex of virus diseases on tobacco was under investigation during the year and young plantations that were infected early on exhibited almost 100 per cent infection at maturity. At the end of the year, the Plant Pathologist was sent to Rhodesia to study the virus diseases on tobacco in that country in connection with this disease outbreak. For the first time, *Armillaria* was recorded on tea plants at Wooton as well as Charcoal Stump Rot of tea. The incidence of virus diseases in potatoes was lower than in past

years, while groundnuts suffered from *Cercospora* leaf-spot as well as *Collar* rot. Trials with bacterial wilt resistant varieties of tomatoes continued with encouraging results. Citrus canker was widespread and is perhaps the most serious disease of citrus in Mauritius. Gray leaf spot of tomato was successfully controlled with maneb and zineb, yields being double. Wettable sulphur or Brestan were successful in controlling leaf spot of groundnuts and the wilt of pea was successfully controlled with dressings of Thiram coupled with an application of the insecticide Thimet. Import permits for plant material were issued and 4,060 certificates of examination were delivered. 548 phytosanitary certificates were issued for plant material being exported. The Plant Quarantine greenhouses at Reduit were maintained in operation throughout the year. During the year, 25 plant diseases were recorded for the first time.

36. The predatory snail *Euglandina rosea* continued to thrive in the release sites at Reduit and Vacoas. This snail is undoubtedly reducing the giant African snail population in the release sites. It is intended to import additional quantities of this predator for release in suitable sites in view of the success obtained. No recovery of fruit fly parasites, that have been released, has been made and with the cessation of supplies of parasites from Hawaii the problem remains unsolved. The rhinoceros beetle, a serious pest of coconuts, was discovered in the vicinity of Port Louis harbour during the year. It can be assumed that this pest gained access to Mauritius from the dependencies where it is well-established. This pest breeds in fallen coconut palms and the dead stumps of palms as well as manure heaps, etc. In consequence a sanitation campaign was commenced in coconut groves to the north of Port Louis with a view to eliminating as far as possible breeding sites. The wasp, *Scolia oryctophaga,* which is abundant in the south of the island, was collected and released in areas known to be infested with rhinoceros beetle. Two months after release, 28 cocoons of the parasite were recovered in manure heaps and dead stumps of coconut palms. The Commonwealth Institute of Biological Control has been approached to secure additional parasites for introduction into Mauritius with a view to controlling this pest. 100 adult and nymphs of the assassin bug, *Platymeris laevicollis,* which were received from Zanzibar were sent to Diego Garcia for liberation in February in an attempt to control the rhinoceros beetle attacking coconuts in that dependency. Caterpillar pests on potatoes and tobacco did considerable damage in some localities and, in some cases, routine chemical control was only partially effective; in severe infestations, the insecticide Telodrin had to be applied in order to obtain a crop. The control of the leaf miner on well-grown tobacco was attempted using a Tifa mist sprayer. The red locust was abundant in the early part of the year on sugar-cane in various localities; 75 to 90 per cent defoliation resulted from attacks by hoppers in certain areas. Aldrin and dieldrin were applied with power sprayers in heavily infested fields with satisfactory results. Insect pests attacking citrus including mites, aphids, scales, etc., were satisfactorily controlled with appropriate insecticides as were pests of tomatoes, other foodcrops and orchard crops. Nuvan fly-bait gave promising results. A knapsack-type power sprayer manufactured in Japan was tested and proved efficient, light in weight and cheap. Tests of the Tifa fogging machine for the control of pests at the tobacco warehouse continued.

37. Samples of various products received were analysed in the Chemistry Division. Routine analyses of the raw materials imported for the manufacture of livestock feeds were carried out as well as analyses of the prepared feeds. The analyses of imported grasses under test, both for dry matter and protein content, was continued as well as routine analyses of the milk produced at the Curepipe dairy. The fat content of 70 per cent of the samples of milk from this dairy fell into the range of 3.5 to 4.5 per cent butter fat. 1,091 samples of milk from small cowkeepers were also analysed to obtain information on the fat and non-fat contents of the milk produced by cowkeepers.

38. In the Engineering Division, an experimental dryer was designed and built for the drying of sugar factory scums used in feeding experiments. The workshop serviced 464 vehicles, tractors and machines and carried out complete overhauls as required. This division also manufactured trailer bodies, a limited amount of furniture, fence posts and miscellaneous items required by various divisions of the Department. During the year, the division completed and handed over a new store for the livestock feed factory, a greenhouse for the rooting of clonal cuttings of tea at Wooton, an extension to the offices of the Central Board as well as an extension to head office of the Department to house the Finance division. The fencing and development of the Roche Bois Quarantine Station were commenced and a further feed store for the livestock feed factory was designed. A total of 6,780,000 yeast tablets were manufactured from imported powder and 4,092 tons of various livestock feeds were manufactured in the feed factory from imported ingredients. The factory offered 13 types of feed to the livestock industry.

39. The enforcement of the fishery regulations and the collection of fish landing statistics were continued. Considerable time and energy were spent in endeavouring to prevent the dynamiting of fish. The construction of fisheries posts at Black River and Mahebourg, together with fish sheds at La Gaulette and Black River were completed while work commenced on the construction of the fish shed at Tamarin and a fisheries post at Trou d'Eau Douce. In the year under review, an additional 250 tons of fish was landed, compared with 1962 at controlled landing stations. A total of 1,475 tons of fish was landed which was 46 tons lower than the average for the years 1956-60. A scheme which provides for loans to fishermen for the construction of boats, which was started in 1960, was completed. 1,184 loans were granted including 23 which have been written off, following the destruction of these boats by a cyclone in February, 1962. The total expenditure has been Rs 499,875; the refund of loans remained unsatisfactory. In September, Dr. H. Fougere of the Fisheries Research Board of Canada, under the auspices of Canadian Technical Assistance, returned to Mauritius and assumed duty as Fisheries Adviser, for an initial period of one year, to implement the recommendations that he had made in his report which was submitted to Government in 1962. Work continued on oyster culture and efforts have been directed towards improving the techniques involved and types of spat collectors. Experiments on the production of dry salt shark were inaugurated.

40. The island of Rodrigues, following cyclone Bertha in December, 1962, suffered from cyclone Grace in February, 1963, which destroyed a promising maize crop, which was planted following the December, 1962,

cyclone. In consequence, relief work had to be organised and, at one stage, the representatives of 2,000 families were employed on such work to the end of May when harvesting commenced of the plantings made, following the February, 1963, cyclone. Following the above disaster, a drought occurred from July to November, preventing the planting of second season foodcrops, save in valley bottom lands, which have been developed for crop production in the last few years. As a result, relief work had to be recommenced in November, employment being given to a maximum of 1,200 people. In December, 1963, cyclone Amanda hit the island, following which an intensive foodcrop planting campaign took place with the result that, by the end of the year, promising foodcrop plantations were visible throughout the island, fruit and vegetable crops being unavailable. On previous occasions when relief work had to be given in Rodrigues, payment was made in cash, which the farmer used to purchase food from the local stores. The staple starchy food of the Rodriguan is maize and, in times of shortage, the farmer was compelled to buy rice from the local stores, maize being unavailable. The Rodriguan is not a rice eater; in consequence, it was decided that, for 1963, relief should be organised in such a way that the farmer, to whom relief employment was given, would be paid partly in cash and partly in kind. For each 12 days of work, 10 days were paid in maize, at the rate of 10 lbs of maize per day; 2 days were paid in cash, to enable the purchase of necessities. This method of relief appears to have found favour with the Rodriguan.

41. The exports of produce from Rodrigues to Mauritius continued to rise. A record onion crop was harvested; some 3,431 bags of onions and garlic were exported. 3,542 pigs were exported which is also a record. The value of exports for the year has been calculated to be not less than Rs 1,500,000.

42. At the close of the year, 1,200 vegetable plots, 702 lowland farms and 1,150 unit farms were leased and 10 dairy farms, situated on the cattlewalk, were nearing completion and will be available for leasing in 1964. Following the successful establishment of Pangola grass in Rodrigues, it became clear that it should be possible to develop peasant dairy farms on the cattlewalk, based on rotational grazing, with an acre of arable land for foodcrop production. If peasant dairy farms can be established on the more fertile areas of the cattlewalk and an adequate water supply can be provided to these farms, it is estimated that at least 500 dairy farms could be established on the cattle walk which, together with milk production from unit and lowland farms, should enable the production of buter and ghee for export. Satisfactory progress was made in land rehabilitation and the targets for farm development were met.

43. Seven tree nurseries were laid down and, by the close of the year, half a million tree seedlings, mainly filao, were ready for planting with the onset of the rains. The object of the reafforestation project is to protect the hilltops and exposed slopes of the island as well as rehabilitate severely eroded land on the top of ridges and on the steeper slopes. 200 acres of such land were reafforested during the year.

44. The development of farm water supplies was continued. Mixed farming requires an adequate supply of water on the farm. There are many small springs on the island between the 300 feet and 600 feet contours. The technique that was been developed for utilising these water sources is to pump the water some 300 to 400 feet to reservoirs on tops of ridges, from which the water is distributed to the farming areas. One dam and pumping station was installed near Citronelle to supply the Mt. Lubin area and was in operation at the end of the year. Pumping stations at Bigarade and Grande Montagne were commenced at the close of the year. A total of 24 dams and 11 storage tanks have been built since the inception of the Development Project and over 120,000 feet of galvaniseed water pipe have been laid.

45. The production of pigs and dairy cattle at the Livestock Breeding Centres and Demonstration Plots was continued. Sales to farmers amounted to 37 dairy cows, 98 young males for fattening for beef production, 6 adult female pigs, 314 young female pigs and 315 young male pigs. In addition a flock of sheep was kept on Gombrani island and at Mangue. The annual cattle census was taken in March and indicated an overall fall in the cattle population to 4,561 head from 4,822 in 1962. The continued fall in the stocking of the cattlewalk is satisfactory owing to the fact that this area is overstocked. With the establishment of Pangola grass on the cattlewalk showing considerable promise, it is possible that once larger areas of the cattlewalk have been put under this grass, the carrying capacity of the cattlewalk will rise considerably.

II. Boards and Committees

46. The Director of Agriculture or his representative served on the following boards and committees:—

Board of Agriculture, Fisheries and Natural Resources
Agricultural College Advisory Board
Board of Examiners of the College of Agriculture
Board of Examiners for the Registration of Agricultural Chemists
Comité de Collaboration Agricole Maurice—Réunion—Madagascar
Customs Tariff Advisory Board
Cyclone and Drought Insurance Board
Fisheries Committee
Irrigation Committee
Land Acquisition Board
Land Settlement Committee
Cane Release Committee
Malaria Advisory Board
Mauritius Sugar Industry Research Institute Executive Board
Mauritius Sugar Industry Research Advisory Committee
Sugar Industry Rehabilitation Fund Committee
Sugar Industry Reserve Fund Committee
Sugar Millers' Rehabilitation Fund Committee
Sugar Planters' Rehabilitation Fund Committee
Government Sack Factory Board
Tea Control Board
Tobacco Board

III. Board of Agriculture, Fisheries and Natural Resources

47. The Board functions under Ordinance No. 29 of 1957. The following committees were set up by the Board for specific purposes:—

(a) The Fisheries Committee

(b) The Land Settlement Committee

(c) The Irrigation Committee

(d) The Cane Release Committee

48. The Board met on three occasions. A committee was set up with co-opted members, to prepare an application for submisson to the United Nations for a land and water resources survey coupled with a cadastral survey. In the event, the committee only met on one occasion when it was decided that there was no point in commencing the large amount of work involved in the preparation of this application until there was an assurance that, if the application was successful, the contribution from Government towards the cost of the project would be forthcoming. While an assurance was awaited, Government obtained a draft application from another source. The recommendations of the Cane Release Committee for approved sugar-cane varieties and the release of M. 423/41 were approved. The Land Settlement Committee held four meetings, the Fisheries Committee two meetings and the Irrigation Committee eleven meetings. The latter committee is concerned with the supply of irrigation water from Mare-aux-Vacoas, Mare Longue, Tamarind Falls, La Ferme and La Nicolière reservoirs and is concerned with the Magenta canal. During the year the committee considered proposals in connection with schemes for increasing the supply of irrigation water to the Black River area as well as to the North.

IV. Mauritius Chamber of Agriculture

49. The Chamber of Agriculture continued to play its important role in the agricultural affairs of the island. As customary, its representatives took part in the annual discussions in the United Kingdom in connection with the Commonwealth Sugar Agreement. It appointed the committee to administer the Sugar Industry Reserve Fund as well as nominated delegates to sit on numerous boards and committees. The work of this organisation is fully reported in its annual report.

V. Mauritius Sugar Industry Research Institute

50. The Institute continued to provide the research services for the sugar industry both in the field and factory and was responsible for extension work amongst the larger planters. Close collaboration between the Institute and the Department of Agriculture enabled the research findngs and recommendations of the Institute to be fully available to small sugar-cane planters, as the Department is charged with the responsibility of extension work amongst small planters. The work of the Institute, which has now completed its tenth year of service, is fully recorded in its annual report which for 1963 clearly demonstrates the value of research in increasing production.

VI. Comité de Collaboration Agricole Maurice—Réunion—Madagascar

51. The meeting of the committee, postponed from 1962, was held in Tananarive from the 12th to 19th of June. It was attended by four delegates from Mauritius. During the course of the meeting, delegates visited the Sakai Land Settlement Scheme, the port of Tamatave, to observe the measures being taken to prevent sugar-cane entering the port area and so possibly being transported to Mauritius; agricultural industries in the Tamatave area as well as the Fiji disease trials at Brickaville. In view of the paramount importance of the Fiji disease trials to the sugar industry of Mauritius, it was decided to contribute Rs 6,000 per annum towards the cost of these trials, this contribution being similar to that paid by Reunion. It was also agreed that annual weekly visits of a party of six Madagascar College of Agriculture students, accompanied by a lecturer, should be accepted by Mauritius and Reunion similar to the present reciprocal visits between Reunion and Mauritius.

52. Among the visits sponsored by the committee in the three territories, the following were of special interest to Mauritius:—

(a) Visit by Mr. R. Antoine to Madagascar in connection with the control of Fiji disease and other diseases of sugar-cane and their distribution in that territory;

(b) Visit by Mr. D. H. Parish to Madagascar to confer with IRAM;

(c) Visit by the four Mauritian delegates to the annual conference of the committee, Messrs. P. O. Wiehe, R. Antoine, G. Rouillard and M. D. ffrench-Mullen;

(d) Visit by Mr. Fritz of Reunion to Mauritius;

(e) Visit by Mr. Salva of Reunion to Mauritius to study the operations of the Sugar Planters Mechanical Pool, etc.;

(f) Visit to Reunion by six students and two members of the staff of the College of Agriculture, Mauritius.

53. Requests for planting material of various kinds from Reunion were met. Amongst material despatched were Pemba and Malayan Dwarf coconuts for seed, breadfruit and " Maison Rouge " plants, a selection of locally produced vegetable seeds and an Anglo-Nubian buck and doe for breeding.

VII. College of Agriculture

54. In 1963, with the end of the combined diploma course in March, the two three-year courses leading to a Diploma in Agriculture and a Diploma in Sugar Technology became the only full-time courses offered at the College. One-year courses for Certificates in Cane Cultivation and Sugar Analysis were held but the one-year course in Tropical Agriculture was not offered, there being no suitable candidate.

55. The Principal of the College, Mr. Alfred North Coombes, O.B.E., retired from the service in August. His successor was Mr. E. L. Limfat, the former Agricultural Engineer of the Department. The teaching staff consisted

of four full-time lecturers and three full-time assistant lecturers and demonstrators and nineteen part-time lecturers. The teaching of Sugar Technology, Engineering, specialised aspects of agriculture and some applied subjects, such as Economics, Statistics and Meteorology, was undertaken on a part-time basis by specialist officers of the Department of Agriculture and the Sugar Industry Research Institute. For the first time, the new practical three-month courses for third-year diploma students were implemented during the long vacation.

Entrance Examinations and Scholarships

56. Fifty-seven candidates applied for admission to the Diploma courses, including one from Rodrigues, forty-three in Agriculture and fourteen in Sugar Technology. Of these, fifteen passed the entrance examinations and were enrolled, nine in Agriculture and six in Sugar Technology. Nineteen candidates were admitted to the Sugar Cane Cultivation Course and two subsequently withdrew. In the Sugar Analysis Course there were eleven admissions.

57. Two entrance scholarships were awarded by the College, one by the Sugar Industry Research Institute and one by the Sugar Industry Staff Employee's Association. One scholarship was awarded by the Ministry of Agriculture and Natural Resources to a candidate from Rodrigues.

Student Body

58. The number and distribution of students were as follows:—

Course	*1960*	*1961*	*1962*	*1963*
Diploma	47	49	51	47
Certificate in Sugar Cane Cultivation ...	19	13	16	17
Certificate in Sugar Analysis	7	10	—	11
Part-time	4	—	2	3
Total	77	72	69	78

Examination Results and Laureateships

59. The results of the annual examinations held in March were as follows:—

	1961		*1962*		*1963*	
	Sat	*Passed*	*Sat*	*Passed*	*Sat*	*Passed*
Diploma in Agriculture First Year	—	—	13	10	11	5
Diploma in Sugar Technology First Year ...	—	—	8	5	8	8
Dipolma in Agriculture Second Year	—	—	—	—	10	10
Diploma in Sugar Technology Second Year ...	—	—	—	—	5	5
Old Combined Diploma :—						
First Year	25	13	—	—	—	—
Second Year	13	13	14	14	—	—
Third Year	9	9	13	12	13	13
Certificate in Cane Cultivation	11	9	13	11	11	5
Certificate in Sugar Analysis	6	6	3	3	—	—

60. Of the six failures in the first-year examinations, four repeated the year and two left to pursue other careeers; of the thirteen who passed in the third year, two obtained the Honours Diploma.

61. A laureateship was awarded to Mr. Raymond Joseph Maurel who was admitted to the Loughborough College of Technology where he is reading for a degree in Electrical Engineering. Admission to the Louisiana State University was also obtained for a third-year student to study Sugar Technology. All former laureates, who are pursuing higher studies at Universities overseas, passed their respective examinations. The 1957 laureate, after obtaining a B.Sc First Class Honours and an M.Sc from Aberdeen returned at the end of the year and was offered and accepted the post of Lecturer in Biology at the College of Agriculture.

Visits of Students to Réunion

62. Under the auspices of the "Comité de Collaboration Agricole Maurice—Réunion—Madagascar", a party of six third-year students, accompanied by the Principal and the Assistant Lecturer in Chemistry, visited Réunion in December, 1963. The return visit by Réunion students could not take place during the year.

Visit by Professor C. T. Leys

63. Professor C. T. Leys of Makerere College, University of East Africa, visited the College in order to study the possibility of setting up a University College in Mauritius. His recommendations were published in a report.

Presentation of Awards

64. His Excellency the Governor presented the Diplomas and Prizes on the 4th July. The Minister of Agriculture and Natural Resources also addressed the assembly. In his annual address, the Principal reviewed the improvements made to the College buildings, the reorganisation of the courses and the increasing interest shown abroad in the College of Agriculture.

VIII. Central Board

65. The Central Board operated under the Sale of Canes (Control) Ordinance. The executive machinery of the Board was run as a division of the Department of Agriculture.

Meetings of the Board

66. The Board held 18 meetings during the year, as follows:—

3 meetings in connection with the assessment of sugar to planters;

1 meeting in connection with the closing down of weighbridges;

4 meetings in connection with changes of delimitation of factory areas;

6 meetings in connection with protests against assessments of sugar;

4 meetings in connection with general business.

Cane Testing

67. The number of tests carried out on the canes supplied by 240 planters or groups of planters, and 132 millers' estate sections totalled 22,939. The tests were carried out at 22 factories. The corresponding figures for the 1962 crop were 20,235 tests in respect of 240 planters or groups of planters and 129 millers' estate sections supplying canes to 22 factories.

Assessment of Sugar

68. Following the publication of figures of provisional assessment of sugar to planters for the 1962 crop, 17 Co-operative Credit Societies, 10 planters and 2 middlemen lodged protests against the awards made by the Board. All the protests were considered by the Board and diverse measures were decided upon to remove the causes of complaint. However, in no case was the provisional assessment varied.

Cost of Production

69. Questionnaires were issued to 90 planters, selected according to the weight of cane produced and to 23 sugar estates with factories to secure the data necessary for the computation of costs of production.

Transport Costs

70. Prior to the crop, a schedule of rates of transport was forwarded to sugar estates with factories showing the maximum rate claimable by millers for the transport of planters' canes from the various outlying weighbridges to the factory in each factory area. The schedule was based on the following formulae:—

$$C = Rs\ (2.60 + 0.155m) \text{ for road transport,}$$

$$\text{and } C = Rs\ (3.45 + 0.55\ m) \text{ for rail transport}$$

where ' C ' is the cost of transport per ton of cane and ' M ' the number of miles over which transport is effected.

Delimitation of Factory Areas

71. Thirteen applications for changes of delimitation of factory areas were received. One of the applications was withdrawn and the others were either rejected or not entertained.

Permits to Middlemen

72. Permits were issued to fifty-six middlemen for the crop.

Complaints against Middlemen

73. Sixty-two complaints against middlemen were received, the majority of them being in connection with the payment of compensation by the Cyclone and Drought Insurance Fund. The disputes were settled through the good offices of the staff of the Board in nearly all cases. One middleman had his permit cancelled on the instructions of the Board.

Cane Contracts

74. 13,840 cane contracts were registered. The total number of contracts in force in 1963 was 14,050 covering some 22,800 planters.

Breach of Sale of Cane (Control) Ordinance

75. There were seven cases of breach of Sale of Canes (Control) Ordinance and prosecutions were instituted in all cases.

76. The number of planters who failed to enter into contract before the 30th June totalled 361 compared with 300 last year.

Cane Varieties

77. During the year under review, the varieties approved for planting were the following: M 134/32 (together with its white and stripe sports), M 112/34, Ebene 1/37, Ebene 50/47, B.H. 10/12, B. 3337, B. 37161, B. 37172, M 147/44, M 31/45, M 202/45 and M 252/48.

Weighbridges in Operation

78. The number of weighbridges in operation was 120, compared with 122 in 1962, two having been closed down with the Board's approval.

Control of Weighbridges

79. Prior to the issuing of a certificate, all the weighbridges were tested and found to comply with the required standard of accuracy on first examination; in three cases minor adjustments had to be made. All weighbridges were tested for accuracy again during the middle of the crop; all save one were found to be accurate and this was rectified immediately.

Surprise Checks carried out at Weighbridges

80. During the crop, 199 surprise checks were carried out and 145 vehicles were re-weighed (54 carts and 91 lorries). In two cases, the weighing was found inaccurate, one weigher was prosecuted and a warning was issued to the other.

IX. The Sugar Industry

Crop Results

81. The total area under cane was 205,000 arpents of which 193,000 were reaped, compared with 204,974 and 193,772 arpents respectively for 1962. On the whole, climatic conditions were normal during the growing period and somewhat below normal in respect of rainfall and temperature during the ripening period. As a result, a record crop of 685,523 metric tons of sugar was produced, which exceeded the previous record of 1959 by some 105,000 metric tons. In 1962, 532,856 metric tons of sugar were made. The yield of sugar per arpent rose to a record of 3.55 metric tons compared with 2.75 metric tons in 1962. The average crushing rate of sugar factories was 97.8 metric tons per hour or 2,036 metric tons per day, compared with 91.0 metric tons and 1,736 metric tons respectively for 1962. It is most unlikely that the Cyclone and Drought Insurance Fund will be called upon to pay compensation in respect of the 1963 crop. If this eventuates, it will be the first occasion that the Fund will not be liable to pay compensation since 1956.

The Sugar Industry Rehabilitation Fund

The Director of Agriculture or his representative was Chairman of the Committees administering the Sugar Industry Rehabilitation Fund, the Sugar Millers Rehabilitation Fund and the Sugar Planters Rehabilitation Fund. This latter fund continued to manage the Small Planters Mechanical Pool and the Cane Nursery at Pointe anx Sables which supplies disease-free planting material and cuttings of newly released varieties to small planters.

Cane Varieties

83. In order of importance, the main varieties making up the 1963 crop were M 147/44, E 1/37, B. 37172 and M 134/32. The above mentioned varieties accounted for about 68 per cent of the crop and the remaining 32 per cent was made up, in order of importance by M 202/46, B 3337, M 93/48, E 50/47, M 31/45, B 34/104 and M 253/48.

Quotas and Prices

84. The negotiated price quota for the calendar year 1963 under the Commonwealth Sugar Agreement was 351,750 long tons at the negotiated price of £46.0.10d per ton, compared with the 1962 price of £45.15.3d per ton for 350,075 long tons. In addition, 213,455 long tons of sugar were exported and sold on the free market, making the total sugar exported for the calendar year 565,205 long tons, compared with 506,623 long tons in 1962. Local sales amounted to 25,569 long tons of which 50 tons were sold to the Seychelles.

Sugar Exports

85. The exports of sugar were as follows:—

Destination	*Long Tons*
United Kingdom	441,200
Nyasaland	250
Canada	56,800
U.S.A.	56,866
Italy	10,089
Total ...	565,205

Molasses and Alcohol

86. The production of molasses amounted to 149,586 metric tons of which 108,740 metric tons were exported. About 9,000 metric tons were used in the manufacture of rum and various alcoholic products and the balance was applied as fertilizer to the cane fields. The total production of alcohol, expressed as pure alcohol, was 1,736,000 litres, the greater part of which was used locally as rum, denatured spirits and in the manufacture of vinegar. 32,160 litres of high strength spirits were exported.

X. Tea Industry

Tea Control Board

87. The Board which was established under the Tea Industry Control Ordinance (Ordinance 29 of 1959 as amended by Ordinance 29 of 1961 and Ordinance 37 of 1963) held regular meetings throughout the year and was mainly concerned with improvement in the standard of manufacture, the sharing of the local market between the various manufacturers and the promotion of the consumption of Mauritian tea. With the co-operation of the manufacturers, the Board launched a " Drink More Tea " Campaign, participated in the Madagascar Trade Fair and sought new outlets for Mauritius tea in South Africa and Australia.

Statistical

88. A report on the Agro-Economic Survey of small tea plantations was submitted to the Ministry of Agriculture and Natural Resources on the 9th December, 1963, for publication. The size of tea small holdings being issued to farmers by Government in the Midlands area was based on the findings of this report.

Managing Agency

89. The Managing Agency Agreement between Government and Nuwara Eliya Tea Estates Company (Mauritius) Limited for the operation of Chartreuse Tea Factory and Midlands Tea Estate expired on the 31st March. A new Managing Agency Agreement was entered into between Government and " La Chartreuse Tea Marketing Co-operative Society Limited ", this Society being composed of planters established on Crown Land in the vicinity of the factory under the Tea Development Project. The new Managing Agency Agreement is of two years' duration and, during this period, the Society has an option to purchase the Chartreuse Tea Factory. During the course of the year, the balance of the planted areas of Midlands Estate was surveyed and the total area planted to tea was found to be below the previous estimate. Leaf production at Midlands estate was 1,283,065 lbs of green leaf compared with 1,043,593 lbs in 1962.

Climate

90. Climatic conditions have been generally favourable for leaf production. During the first seven months of the year, there were very few dry days, which seriously retarded land clearance operations. The last five months were dry and favourable for the clearance and preparation of new land to be planted to tea. At the Tea Experiment Station the rainfall for the year was 119 inches which was below that of 150 inches expected in a normal year.

Tea Factories

91. With the exception of Mare Anguilles Tea Factory, all factories operated throughout the year. A major reconstruction and development programme was commenced at Nouvelle France Tea Factory. The Bois Cheri and La Flora factories installed withering troughs to increase and improve their withering capacities. Preliminary planning for the extension of Chartreuse Tea Factory from $\frac{3}{4}$ million to $1\frac{1}{2}$ million pounds capacity was undertaken and some equipment ordered.

Mauritian Tea

92. Production rose in the year under review to 3,256,891 lbs, an increase of 457,264 lbs over the previous year and an increase of 447,857 lbs over the previous best year (2,809,034 lbs in 1961). Approximately one-third of the production was consumed locally, the remainder being exported. The price of Mauritian tea on the London Market unfortunately showed a definite drop. 16,837 chests of Mauritian tea were sold on the London Auctions at an average price of 3 shs 5.81d per lb compared with 12,273 chests at 3 shs 11.2d per lb in 1962. No tea was offered for sale on the Nairobi Auctions but the sale of tea for export by private treaty continued on a limited scale.

Development Project

93. The Tea Development Project, which was started in 1956 and was designed to develop 3,000 acres of new land under tea, was due to be completed in June. As a result of representations from the participating planters, the scheme was extended for a further two years owing to the setbacks suffered during the cyclones of 1960 and subsequent cyclones. Planters within the project received further encouragement during the latter half of the year by the agreement of the Agricultural Bank to increase the rate of loans for tea planted prior to 1961. By the end of the year, planters on private lands under the scheme had planted 212 acres and those on Crown Lands, 1,407 acres, Government having planted 289 acres as its contribution to the scheme, a total of 1,908 acres was under tea. Of the 289 acres planted by Government, 138 acres, divided into 33 small holdings of about 4 acres each, were leased to farmers.

New Development Project

94. Work proceeded satisfactorily on the new development project which envisaged the planting of 500 acres of tea per year by Government for distribution, when fully established, as small holdings. By the end of the year, 1,280 acres were contour surveyed, 1,090 acres cleared, 650 acres prepared for planting and 615 acres planted.

Tea Seed

95. 17,750 lbs of first grade tea seed was imported from East and Central Africa, 13,750 lbs from Nyasaland and the remainder from Tanganyika. The harvest of 9,750 lbs from local seed gardens showed some improvement on the previous year but was still below expectations. The main source of local supply continued to be the 10-acre garden at Parc-aux-Cerfs which yielded 9,250 lbs. The new seed garden at Crown Land de Rauville was planted with selected plants of a broad leaf Assam type and is making satisfactory progress.

Tea Experimental Station

96. Climatic conditions were favourable to leaf production. The green leaf harvested at Wooton during the tea crop year 1962-63 (July-June) amounted to 244,297 lbs, a considerable increase over the previous year, although not quite equal to the record crop of 295,914 lbs harvested during the crop year 1960-61. The comparative yields of green leaf from the 70 acres in bearing at Wooton for the crop years 1961-62 and 1962-63 are given below:—

Green Leaf Crop Harvested at Wooton in lbs

Year	*July*	*August*	*September*	*October*	*November*	*December*	*January*	*February*	*March*	*April*	*May*	*June*	*Total*
1961–62	1,565	—	—	3,954	5,500	20,365	23,550	34,139	14,977	17,912	4,262	906	127,130
1962–63	128	—	—	141	20,504	31,880	48,513	43,756	40,084	34,333	21,966	2,992	244,297

Yields in the first six months of the present season 1963-64, exceeded those of last season and gave promise of a record crop.

97. The construction of a greenhouse to accommodate a mist propagator at Wooton was completed in October and initial observational trials in respect of various rooting mediums for tea cuttings were commenced.

98. Normal routine pruning and weeding was continued. An area of approximately one acre of land in field No. 9, which had not been previously cultivated, was cleared and planted with stumps. Part of the station abutting on an area of rural development was fenced with chain link fencing. The following experiments were undertaken during the year:—

(a) *Long term*

1. Fertilizers
2. Pruning
3. Spacing

(b) *Short Term*

1. Cultivation trial
2. Use of Folex as defolient
3. Germinating tea seed
4. Fertilizer trial in tea nursery

Area planted to tea

99. The number and acreage of the tea plantations were as follows:—

Total number of plantations	429
	Arpents
Aggregate area	5,374.5
Area of mature plantations (approx.) ...	2,500
Area in Partial bearing (approx.)	2,000

Extent (arpents)	*Aggregate area (arpents)*	*% of Total Area*	*No. of Plantations*	*Average size (arpents)*
0 less than 5 ...	795.0	14.8	372	2.14
5 do 25 ...	252.0	4.7	27	9.33
25 do 100 ...	1,109.2	20.6	19	58.37
100 and above ...	3,218.3	59.9	11	292.57
TOTAL ...	5,374.5	100.0	429	12.53

The largest plantation under single management was 837 arpents; the second largest 495 arpents. There were 70 plantations of less than 1 arpent.

Production

100. Mauritius produced 3,256,891 lbs of black tea in 1963. No green tea has been manufactured since 1956. The output of factories over five years was as follows:—

Factory	*1959* *lbs*	*1960* *lbs*	*1961* *lbs*	*1962* *lbs*	*1963* *lbs*
Bois Chéri	654,545	563,408	959,233	861,731	1,086,548
La Flora	502,258	527,050	689,829	774,650	806,447
Usine Corson	332,523	282,040	426,365	426,803	534,996
Pont Colville	128,374	116,141	235,423	237,793	291,190
Nouvelle France ...	268,582	188,127	208,310	148,620	105,713
Chartreuse	110,821	56,109	230,215	266,892	431,997
Mare Anguilles ...	—	—	59,659	83,138	—
TOTAL ...	1,997,103	1,732,875	2,809,034	2,799,627	3,256,891

101. The total export to all destinations was 2,175,493 lbs which compare with previous years as under:—

Destinations	*1959* lbs	*1960* lbs	*1961* lbs	*1962* lbs	*1963* lbs
United Kingdom ...	815,596	445,949	1,732,329	1,582,881	2,150,257
South Africa	112,832	10,505	2,443	977	6,482
New Zealand & Australia ...	—	—	426	—	—
Other Commonwealth Countries ...	—	—	11,432	—	--
Madagascar & Reunion ...	3,471	2,156	210	—	1,841
Western Europe ...	42,171	5,920	—	5,358	—
United States of America ...	49,401	—	—	—	16,902
Seychelles	—	—	—	—	11
TOTAL EXPORTS ...	1,023,471	464,530	1,746,840	1,589,216	2,175,493

102. Imports of tea were as follows:—

Country	*1959* lbs	*1960* lbs	*1961* lbs	*1962* lbs	*1963* lbs
China	6,163	7,781	7,327	10,190	8,669
Hong Kong	4,229	2,891	2,985	3,320	2,412
Ceylon	8,050	8,507	9,046	5,095	1,466
India	3,740	744	478	—	705
Formosa	—	—	—	—	736
Other Countries ...	22	297	1,567	1,065	—
TOTAL IMPORTS ...	22,204	20,220	21,403	19,670	13,988

XI. Tobacco Industry

103. Production of cured tobacco was limited to the estimated requirements of local cigarette manufacturers, the British-American Tobacco Co. (M'tius) Ltd and the Amalgamated Tobacco Corporation (M'tius) Ltd. The industry is controlled by a Board which publishes annually a full report on its activities.

CROP CONDITIONS

104. Weather conditions were favourable for the production of flue-cured Virginian and air-cured Amarello but were less favourable for the production of Burley. The yield of leaf and the financial return to growers were higher than in the previous year.

105. The incidence of Frogeye spot and *Alternaria* leaf spot was negligible. Rootknot nematodes were observed in a few plantations. Some plantations of Virginia tobacco in Black River, Pamplemousses and Flacq were severely affected by Mosaic. Slight attacks of Mildew were reported.

106. Aphids and caterpillars were more prevalent than in previous years.

Permits

107. The number of permits issued in 1963 compared with that of the previous year is tabulated below:—

	1962		1963	
	Arpents	*Kilogs*	*Arpents*	*Kilogs*
Flue-cured Virginian	490	195,000	620	250,000
Flue-cured Amarello ...	78	75,000	—	—
Air-cured Amarello	105	100,000	154	140,500
Burley	17	10,000	17	10,000
TOTAL ...	690	380,000	791	400,500

Permits for an increase acreage were issued. Owing to the large stocks of flue-cured Amarello tobacco in store, and the fact that the demand for this tobacco had fallen off, no tobacco of this type was required in 1963 and it is unlikely that flue-cured Amarello will be produced in the foreseeable future.

Production

108. The production of tobacco in 1963 compared with 1962 is tabulated below:—

	1962		1963	
	Arpents	*Kilogs*	*Arpents*	*Kilogs*
Flue-cured Virginian	483	206,093	615	307,678
Flue-cured Amarello	78	64,382	—	—
Air-cured Amarello	104	96,725	152	166,508
Burley	16	4,538	17	9,122
TOTAL ...	681	371,738	784	483,308

Yields and Returns

109. The yield of leaf and the financial return to growers of flue-cured Virginian, air-cured Amarello and Burley were higher than in 1962, the yield of leaf and financial return to growers of flue-cured Virginian being the highest on record. Purchase prices remained unaltered.

	Average yield per arpent	
	1962	*1963*
	Kgs.	*Kgs.*
Flue-cured Virginian	427	500
Flue-cured Amarello	825	—
Air-cured Amarello	930	1,095
Burley	283	536

	Average return per arpent	
	1962	*1963*
	Rs	*Rs*
Flue-cured Virginian	3,103	3,772
Flue-cured Amarello	4,953	—
Air-cured Amarello	2,312	2,792
Burley	717	1,328

	Average value per kilog	
	1962	*1963*
	Rs	*Rs*
Flue-cured Virginian	7.27	7.55
Flue-cured Amarello	6.00	—
Air-cured Amarello ...	2.48	2.55
Burley	2.52	2.47

Quality

110. The quality of the flue-cured tobacco produced was higher than in the previous years while that of air-cured was similar to that produced in 1960.

	Percentage of Bright and Medium Grades				
	1959	*1960*	*1961*	*1962*	*1963*
Flue-cured	75	85	70	90	91
Air-cured	10	34	23	24	32

Local Manufacture

111. The manufacturers' purchases and usings of domestic and imported leaf were as follows:

1963—Purchases

	Domestic	*Imported*	*Total*	% *Total Imported*	*C.I.F. value per kg.* *Imported*	*Domestic*
	Kgs.	Kgs.	Kgs.		Rs	Rs
B.A.T. Mts. Ltd. ...	378,567.6	140,253.0	550,600.6	34.2	10.16	7.42.8
A.T.C. Mts. Ltd. ...	31,780.0					5.87.2
Total ...	410,347.6	140,253.0	550,600.6	34.2	10.16	7.30.7

A.T.C. (M'tius) Ltd. purchased flue-cured Virginian and air-cured Amarello tobaccos.

1963—Usings

	Domestic	*Imported*	*Total*	% *Total Imported*	*C.I.F. value per kg.* *Imported*	*Domestic*
	Kgs.	Kgs.	Kgs.		Rs	Rs
B.A.T. Co. Mts. Ltd....	373,995.5	106,554	480,549.5	22.2	—	—
A.T.C. Mts. Ltd. ...	83,732.375	14,185.125	97,917.5	14.5	—	—
Total ...	457,727.875	120,739.125	578,467.0	20.8	—	—

1962

Purchases	485,108.8	118,993.0	604,101.8	19.7	10,07	5.66
Usings	424,447.1	136,282.5	560,729.6	24.3	—	—

112. The percentage of imported leaf used in manufacture has again decreased in 1963, but it is still higher than in 1958, as shown by the following figures:—

	Year					
	1958	*1959*	*1960*	*1961*	*1962*	*1963*
% Imported	15.8	18.6	23.9	24.9	24.3	20.8

113. These figures seem to indicate that the increase in duty of Rs 5.00 per kg. on imported leaf imposed on the 5th June, 1962, has resulted in an increase in consumption of domestic leaf. The average C.I.F. value of imported Virginian leaf was Rs 10.16 per kg. compared with Rs 9.71 per kg. for domestic Virginian. The average values of flue-cured and air-cured Amarello, purchased by the manufacturers, were Rs 7.10 and Rs 3.12 per kg. respectively.

114. Domestic Virginian blended with imported leaf is used in the manufacture of "Matinée," "Vogue," "Embassy," "Soirée," and "Mills" brands of cigarettes which sell in competition with imported Virginian cigarettes. Amarello leaf and some of the lower grades of domestic Virginian are utilised for the cheaper brands selling below the price range of imported cigarettes.

Imports

115. Imports of leaf and cigarettes for the last two years are tabulated below:—

	1962		*1963*	
	Kgs	*Value Rs*	*Kgs*	*Value Rs*
Cigarettes	20,873	415,732	22,383	459,935
Leaf:				
Rhodesia	36,039	301,191	45,553	365,555
U.S.A.	82,945	896,595	94,700	1,059,790
Other Sources ...	9	90	—	—
Total Leaf ..	118,993	1,197,876	140,253	1,425,345
Grand Total ...	139,866	1,613,608	162,636	1,885,280

116. Usings of domestic leaf have increased by 33,280.775 kgs and usings of imported leaf have decreased by 15,543.375 kgs compared with 1962, the percentage increase in usings of domestic leaf being 7.8 and the percentage decrease in usings of imported leaf being 11.4. In spite of an increase in duty of Rs 2.00 per kg on imported cigarettes with effect from the 14th December, 1962, imports of cigarettes increased by 1,510 kgs compared with 1962, an increase of 7.2 per cent.

Warehouse

117. Slight improvements were made to the Board's offices. A Marshall C.B. 60 oil fired boiler and a Lister diesel generating set were installed.

XII. Fibre Industry

118. The total production of Mauritius Hemp continued to be sold by the Mauritius Hemp Producers Syndicate to the Government Sack Factory for weaving into sacks used mainly for the bagging of sugar. Comparative statistics in connection with production were as follows:—

	1962	*1963*
No. of factories operating	12	12
Fibre produced (metric tons)	1,299	1,349
Value (Rupees)	1,559,090	1,636,903
Area under aloe (arpents) :		
Wild	3,040	2,840
Plantation	376	306

Sack Factory

119. This organisation is controlled by a Board which publishes annually a full report on its activities.

120. The factory purchased fibre produced locally and imported jute cuttings from India to the extent:—

		1962	1963
		Kgs	*Kgs*
	Aloe :	1,299,242	1,348,959
	Jute :	408,588	308,465
The carry over from 1962 was	Aloe :	17,958	126,893
	Jute :	84,918	124,993
The factory consumed	Aloe :	1,190,504	1 408,581
	Jute :	368,508	209,490
Excess in stock	Aloe :	315	533
Shortage in stock	Jute :	—	193
Aloe fibre sold	—	118	110
The carry over for the year was	Aloe :	126,893	67,695
	Jute :	124,993	223,775

121. In 1963 the prices paid for fibre were as follows:—

	1962	1963
	Price per ton	*Price per ton*
Aloe Fibre :—	*Rs c*	*Rs c*
Very Good ...	1,300 00	1,300 00
Good	1,250 00	1,250 00
Fair	1,225 00	1,225 00
Tow	1,000 00	1,000 00
Sisal	1,250 00	1,250 00
Cuttings	900 00	900 00
Ropes	900 00	900 00
Jute :—		
Hearts	1,101 44	793 80
Cuttings	711 03	649 10

122. The average price payable for aloe fibre was Rs 1,200 per ton and this will be applicable until 31st December, 1966 in accordance with the Tripartite Agreement which has been extended for a further year by the Sugar Millers, the Mauritius Hemp Producers' Syndicate and the Government Sack Factory.

123. The factory's output for 1963 compared with that of 1962 was as follows:—

	1962	1963
	Units	*Units*
Sacks (6×8) Aloe ...	400,736	794,597
Sacks (5×7) Aloe jute ...	1,070,052	705,524
Other sacks	29,389	34,383
	Yards	*Yards*
Filter Press Cloth ...	26,393	27,990
Other Fabrics	4,169	1,745
	Kgs	*Kgs*
Yarns	17,557	17,334
Ropes	10,260	8,376

124. In 1963, the Government Sack Factory operated at a net loss of Rs 569,951.91 compared with a net loss of Rs 496,412.84 in 1962. The difference in the net loss arose directly from the lower selling price of the two types of sacks in 1963 which was Rs 1.38 for the (6×8) aloe sack and Rs 1.13 for the (5×7) aloe-jute sack compared with Rs 1.49 and Rs 1.22 respectively in 1962.

XIII. Livestock

Milch Cattle

125. The selection within the creole breed was continued but on a reduced scale. It was decided in the middle of the year that the improvement of milk yield of the creole breed, using the progeny testing technique, should continue on a long term basis but, as a rapid increase in milk production within the breed could not be expected by this technique and there was an urgent need to increase liquid milk production, cowkeepers should be given the opportunity of utilising the higher liquid milk production potential in the tropics of the grade Friesian. Although breeding records of previous trials with grade Friesians had been lost, it would appear that these failed mainly because of lack of control of the amount of Friesian blood in the cross. In consequence, it is intended that the crosses should not go above three-quarter Friesian and the backcross should be either to the Creole or Sahiwal breeds. The implementation of this policy of producing grade Friesian depends on the completion of the animal census and the preparation of the necessary records. Six Friesian bulls were imported from Australia at the end of the year.

126. The two livestock breeding stations at Curepipe and Palmar carried a total of 287 head of stock of the Creole breed at the end of the year.

127. An average of 71 cows were in lactation throughout the year with a mean production of 6.4 kgs per head per diem. There were 106 calvings, 53 males and 53 females. Forty-one heifers calved at an average age of 31.5 months. The average weight of the bull calves at birth was 30.6 kgs and that of heifer calves 29 kgs. Over a lactation period of 305 days, first calvers yielded 5.20 kgs, second calvers, 5.32 kgs and third calvers, 7.00 kgs of milk per head per diem. Cows with more than 3 calvings yielded 9.90 kgs of milk per day.

128. Eight young steers were transferred to Richelieu Rehabilitation Centre and twenty were sent to Rodrigues.

Herd Cattle

129. The livestock breeding station at Palmar carried 70 head of cattle of the Ongole breed and 44 head of the Boran breed.

130. The Ongole bulls were removed from the herd early in the year and this herd was sired by a recently purchased Brahman bull. 10 calves, 5 males and 5 females, sired by an Ongole were born. The Brahman bull showed limited mating interest at the outset but improved after treatment and it is now believed that some of the cows are in calf to him.

131. The Borans continued to thrive. Fourteen calves were born, 7 males and 7 females. Four breeding males were sold to local breeders and two adult bulls were transferred to Rodrigues to improve the beef characteristics of the herd cattle on the Cattlewalk.

Pigs

132. The piggery at Curepipe livestock breeding station contained an average of 41 animals of all ages of the Large White Breed. There were 5 farrowings and the average number of piglets born to each sow was 10. There was no demand for young stock for breeding. A number of culls were sold for slaughter.

Goats

133. The herd of goats at the Palmar livestock breeding station comprised 58 Anglo-Nubian and 15 British Alpine. The production of the British Alpine breed was suspended as this breed has not done well under local conditions. Twelve young Anglo-Nubian bucks were distributed to breeders. Two bucks and three does of this breed were stationed at three extension service district headquarters and one buck and one doe were presented to Reunion.

Rabbits

134. As at 31st December, there were 124 rabbits in the rabbitry at the Curepipe livestock breeding station, 10 adult bucks, 12 adult does and 102 rabbitlings. During the year 33 does kindled producing 195 rabbitlings. Fourteen litters were weaned and the following information recorded breedwise: —

	Average Number born	*Weaning at 50 days*	
		Average Number Weaned	*Average Weaning Weight*
Flemish Giant	6.4 (5 litters)	5.5 (2 litters)	1.87 lbs (2 litters)
Chinchilla Giganta	7.0 (9 litters)	6.6 (6 litters)	2.01 lbs (6 litters)
Californian White	5.1 (8 litters)	5.7 (4 litters)	1.87 lbs (4 litters)
New Zealand White ...	6.0 (8 litters)	4.0 (2 litters)	2.21 lbs (2 litters)

A rabbitry was built at Réduit to provide accommodation for breeding stock.

Poultry Breeding Centre

135. The breeding programmes for the White Leghorn, Rhode Island Red, Light Sussex and White Rock stock were continued. The '404' parent stock imported in 1962 were mated during the year to produce '404' hybrids which have become very popular. 6,805 day-old and month-old hybrid pullets and 2,994 day-old hybrid cockerels, reared for broiler production, were supplied to local poultry keepers.

136. With the setting up of the demonstration broiler unit and processing plant, the production of day-old broiler chicks from White Rock, Light Sussex and Rhode Island Red stock increased both for rearing at the poultry centre at Réduit and for sale to broiler producers. Of the 16,313 broiler chicks and '404' cockerels hatched, 10,861 were sold to table poultry producers and the remaining 5,452 were reared in the broiler unit at the poultry breeding centre.

137. The Australorp stock, which was used in previous years to produce Austrawhite chicks, by crossing with White Leghorn, was scrapped as the Austrawhite stock supplied to local poultry keepers proved to be highly susceptible to visceral and neural lymphomatosis.

138. The Broad Breasted Bronze turkeys imported from the United Kingdom in August 1962 were mated. The poults were brooded at the poultry breeding centre and transferred to the Palmar livestock breeding station at 8-9 weeks of age where they were housed in fold units. Out of the 232 poults hatched, 56 were sold to breeders either as day-old or month-old; 146 were brooded successfully. The poults did very well, there being only one casualty and 3 culls to 5 months of age. Their growth rate was most encouraging and some 25 young cocks killed and processed at the end of the year averaged 10 lbs dressed weight and the finished carcases were very satisfactory. Breeding stock was sent to Rodrigues to improve the local turkey.

Egg Production

139. The production of the breeders and progeny under test was better than in 1962.

140. The table hereunder gives the monthly egg production of the various main breeds kept at the poultry breeding centre during 1963:—

Month	*White Leghorn*	*Rhode Island Red*	*Parent Stock 404*	*Light Sussex*	*Total*
January	2,972	1,659	1,536	2,840	9,007
February ...	2,504	1,473	4,036	2,982	10,995
March	2,361	1,799	4,173	3,387	11,720
April	1,852	1,076	4,193	2,763	9,884
May	1,849	844	3,227	1,928	7,848
June	3,782	2,119	2,285	1,325	9,511
July	4,981	4,950	2,680	1,545	14,156
August	6,775	5,238	3,611	2,009	17,633
September ...	7,568	5,025	3,863	1,417	17,873
October	7,942	4,347	3,661	2,128	18,078
November ...	6,867	3,246	2,731	2,177	15,021
December ...	6,097	2,814	2,433	2,044	13,388
TOTAL ...	55,550	34,590	38,429	26,545	155,114

141. The following number of eggs was produced monthly at the poultry unit at the Curepipe experiment station:—

January	*February*	*March*	*April*	*May*	*June*	*July*	*August*	*September*	*October*	*November*	*December*	*Total*
652	807	813	1214	1129	1271	1616	1790	1021	806	459	376	11,954

142. Egg production is generally at its optimum during the period July to October.

143. Of the 167,058 eggs produced at the poultry centre and poultry unit at Curepipe, 106,875 units were sold as table eggs; 44,550 units were set in the incubators for the supply of chicks to the public and for replacement stock and broiler production at the poultry centre and 4,630 units were supplied to the Animal Health Laboratory.

Productive Performance

144. During the year under review, 30,784 chicks were hatched at the poultry breeding centre out of 44,550 eggs set. Both the fertility and hatchability were good, the fertility averaging 82.9 per cent over the year and the hatchability of all eggs set was 70.0 per cent.

145. The following table gives the monthly reproductive performance of the breeders:—

Month	*% Fertility*	*% Hatch. of all egg set*	*% Hatch. of Fertiles*
January	66.1	55.2	86.1
February	71.7	60.1	81.1
March	89.2	72.1	87.6
April	89.6	69.7	81.4
May	84.6	61.4	72.7
June	85.7	72.7	84.9
July	87.7	76.5	87.3
August	88.4	73.2	82.9
September	88.1	65.2	64.1
October	87.5	73.1	83.5
November	78.7	51.9	65.9
December	78.1	42.0	65.1

It is interesting to note from the above table that there is a significant drop in both fertility and hatchability of all eggs set during the months of January, February, November and December. This drop can be accounted for by the unfavourable climatic conditions prevailing during these months.

146. The '404' parent stock gave the best reproductive performance during 1963, with an average fertility of 89.8 per cent, a maximum fertility of 92.4 per cent in July, an average hatch of fertiles of 84.2 per cent, a maximum of 90 per cent in July and an average hatch of all eggs set of 75.6 per cent, a maximum of 83.7 per cent in July. The White Leghorn breeders also did well giving 85.6 per cent, 81.6 per cent and 69.8 per cent respectively while the White Rock stock gave a reproductive performance below average of 78.8 per cent, 54.0 per cent and 42.5 per cent respectively.

Artificial Insemination and Veterinary Aid Service

147. In spite of the shortage of trained staff, which was still more acute in 1963, 11,413 artificial inseminations were done in pursuance of the policy to upgrade the local type of stock owned by peasant farmers by using selected bulls from the progeny testing programme.

148. Over 1,600 pregnancy assessments were made, 192 cases of infertility were dealt with and 511 cases of difficult calving were successfully assisted. The number of cases attended by the artificial insemination and veterinary aid services were as follows:—

Nature of cases	*January*	*February*	*March*	*April*	*May*	*June*	*July*	*August*	*September*	*October*	*November*	*December*	*Total*
Artificial Insemination ...	602	642	798	683	552	616	703	665	591	614	484	363	7,313
Re-Insemination	201	203	257	248	211	196	262	283	241	326	251	210	2,889
Other Re-Insemination ...	81	65	108	100	90	88	97	89	85	123	130	98	1,154
Heat over not on Heat ...	106	94	134	102	92	99	124	103	109	114	116	104	1,297
Pregnancy Assessment ...	162	118	148	139	170	144	128	119	153	105	132	98	1,616
Sterility	17	12	24	18	23	13	21	13	18	17	12	15	203
Calcium and Phosphorus deficiency	72	53	67	40	41	52	48	37	61	70	104	81	726
Udder troubles	44	44	51	44	34	30	18	16	20	18	19	18	356
Calving troubles	36	36	40	45	27	28	29	30	29	29	38	30	397
Digestive troubles	51	54	48	57	62	36	35	23	32	49	42	49	538
Miscellaneous	42	42	69	67	54	52	55	65	65	57	47	40	665

XIV. Animal Health

149. The standard of health of the stock at the various livestock and agricultural stations was satisfactory, thus providing optimum conditions for the successful implementations of the breeding programme.

Cattle

150. As in 1962, no case of summer mastitis amongst the milch cattle at the breeding stations was recorded. The young stock also grew satisfactorily.

Goats and Pigs

151. The adult stock did well save that a few cases of lameness were encountered in pigs which yielded to treatment.

Poultry

152. The overall health picture of the stock at the poultry breeding centre was satisfactory. Coccidiosis among the chicks and growing stock was negligible due mainly to the feeding of mashes containing a coccidiostat. The major diseases affecting the stock during the year were neural and visceral lymphomatosis. Worm infestations were kept under control through a regular programme of deworming. Avian Encephalomyelitis or Epidemic Tremor was recorded amongst chicks early in the year. Blood serum samples taken at random from the stock at the poultry breeding centre and sent to Oonderspoort, South Africa, for serological diagnosis of Infectious Bronchitis yielded negative results.

Rabbits

153. The main cause of mortality among young rabbits was coccidiosis. Treatment with sulpha drugs proved efficient against this disease.

Laboratory Services

154. The new Animal Health Laboratory was inaugurated in February. 2,219 post mortem examinations were carried out on large and small animals. In addition, 46 faecal examinations were carried out and 13 raw hide articles imported by the public were sterilised prior to release.

155. The Laboratory produced the following vaccines during the year:—

	doses
Newcastle Disease Vaccine Live ...	273,800
Newcastle Disease Vaccine Inactivated ...	91,200
Fowlpox Vaccine	47,500
Canine Distemper Vaccine	3,600

Animal Quarantine Service

156. In accordance with the provisions of Animal Diseases Ordinance, 823 import permits and 582 landing permits were issued. 10 aircraft and 73 ships transporting livestock or livestock products were cleared. All frozen meat

landed was subjected to veterinary inspection prior to release. 50 certificates of veterinary health were issued in respect of the export of molasses and 36 veterinary certificates of health were issued in respect of the export of dogs, horses and birds.

157. 5,185 head of cattle were received into the Fort George quarantine station from Madagascar and were released for slaughter after quarantine to the Roche Bois, Rose Hill and Curepipe abattoirs. Four dogs and two cats were received into quarantine at Réduit.

158. Six Friesian bulls were received from Australia for the cattle breeding programme in Rodrigues and Mauritius.

159. The quarantine station at Fort William was transferred to Roche Bois. A cattery was added to the quarantine facilities whilst improvements to the kennels at Réduit were effected to ensure better disease control.

Tuberculin Testing

160. Owing to the shortage of staff, the annual tuberculin testing of cattle was greatly hampered. Tests were carried out between 24.4.63 and 10.8.63 on 429 head of herd cattle, 144 head of milch cattle and one draught bullock. There were 6.9% reactors among the herd cattle and 2% among the milch cattle.

Slaughter House Control

161. The six slaughter houses were regularly inspected with a view to controlling meat inspection and abattoir hygiene. Weekly returns were introduced at all slaughter houses with effect from the first of January and have proved invaluable in the compilation of slaughter data by breeds, etc. Under the Food Control Order, 3,183 cows of the milch breed, considered to be unfit for future breeding, were slaughtered.

162. Permits for slaughter were delivered in respect of 135 animals of the milch breed on humane grounds. Except for cases of severe burns, all carcases so slaughtered were placed in cold storage for a period of 15 days prior to sale.

Advisory Service

163. Apart from the field staff who advise stock owners on feeding and management problems, the senior staff of the veterinary services gave specialist advice to a large number of breeders.

Feeding Trials

164. Trials to assess the value of dry defecation scums, a by-product in cane sugar manufacture, as a concentrate ration for milk cows, continued. Fifty-two cows in milk were placed on the trial. They were divided into four groups, each group composed of an equal number of cows at the same lactation period, the total production of milk of each group being equal. They

were all housed in the same byre. The quality and quantity of fodder for the four groups were the same throughout the experiment. In the crop season, that coincided with the winter, they were fed entirely on cane tops; out of the crop season they were fed with mixed grasses. The level of feeding of the concentrate rations was the same for all groups.

165. Group I, the experimental group, was fed with a concentrate ration composed of 50 per cent dry defecation scum, 35 per cent molasses, 15 per cent fish meal, with the addition of 1 lb of mineral mixture per ton of feed. The second group, the control group, was fed with the normal concentrate feed used at the dairy, containing one lb of mineral mixture per ton. Further the cows of this group received 4 oz of bone meal daily. The third group was fed with the normal feed as above but was not given bone meal. The fourth group was fed no concentrate at all.

166. The results obtained were very encouraging. Cows in group I, the trial group, produced the same quantity of milk as group II on normal ration. Cows in group III produced the same quantity of milk but showed clinical symptoms of calcium/phosphorus deficiencies. Cows in group IV not only gave less milk than the previous three groups but lost so much condition that they had to be fed concentrates in form of scum/molasses/fish meal. Soon after they were given the concentrates they improved in condition and their milk production went up. It would appear from this trial, which commenced in July and is still continuing, that the scum/molasses/fish meal was as good for milk production as the normal feed which is blended from imported feedstuffs, and thus more expensive; also that with the scum/molasses/fish meal ration, there is no necessity to add 4 oz of bone meal daily to the ration because of the fact that the scums contain calcium and phosphorus. It has shown that cows fed on fodder only without the addition of concentrates can produce at least 50 per cent more milk without losing condition if the fodder is supplemented by a ration composed of dry scum/molasses/fish meal in the proportion of 50:35:15.

Experimental Work and Special Investigation

167. The following experimental work was carried out in the Animal Health Laboratory. Ectoral (Ronnel 0.0 dimethyl 0-2,4,5 trichlophenyl phosphorothioate) given orally to dogs harbouring fleas and ticks at the rate of 25 mg/lb body weight every 2 days for 4 treatments was successful in clearing the dogs of fleas. 50 mg/lb body weight of Ectoral was necessary to clear the dogs of ticks. Reinfestation was prevented by a weekly dose of 25 mg/lb for fleas and a twice weekly dose of 50 mg/lb for ticks. Ectoral was also found to be effective against Chemidocoptic infestation in budgerigars.

168. Disophenol D.N.P. was tested on stray dogs impounded at Plaine Verte, Port Louis, in connection with the treatment of Ankylostomiasis and Spirocercosis. A single injection of the drug was found to be most effective in destroying hookworms in infested dogs. It showed also a marked lethal action on *Spirocerca lupi*

169. A survey of the ecto-and-endo-parasites of stray dogs was carried out at the pound at Plaine Verte and the following parasites were recovered and identified:—

(i) External:—

(a) Two species of ticks: *Rhipicephalus sanguineus* and *Rhipicephalus evertsi;*

(b) Two species of flea: *Ctenocephalides felis stronglus* and *Pulex irritans;*

(c) Two species of louse: *Trichodectes canis* and *Heterodoxus spiniger;*

(d) Demodex canis.

(ii) Internal:

Spirocerca lupi, Dirofilaria immitis, Toxocara canis, Trichuris vulpi. Ankylostoma canirum, Ankylostoma braziliense and *Dipylidium canimum.*

170. At the poultry breeding centre a trial was carried out to assess the relative merits of three crosses for broiler production. It was found that the White Rock × Light Sussex gave heavier broilers at 12 weeks, average 1,342 gm. than Rhode Island Red × Light Sussex and Light Snssex × Rhode Island Red but the Rhode Island Red × Light Sussex was a better feed converter, 3.2: 1 as compared with 3.4: 1 for the White Rock × Light Sussex and 3.7: 1 for the Light Sussex × Rhode Island Red; as far as fleshing quality was concerned the White Rock × Light Sussex was superior.

XV. Land Settlement

171. The Land Settlement Committee held four meetings in connection with conditions of tenure, selection of new tenants and transfer of holdings.

172. The tenants have generally followed the advice given by extension officers for the improvement of crop husbandry. Their holdings were kept in a satisfactory state of cultivation and their standard of farming is improving gradually. On many settlements, the foodcrop area was not fully utilised and the tenants have renewed their requests that they should be allowed to crop this area in sugar-cane.

173. Rent collection was again very unsatisfactory, and Government has approved the following rent adjustments:—

(a) For Crown Land under sugar-cane, 4 per cent of the capital value;

(b) For Crown Land under foodcrops, 2 per cent of the capital value;

(c) The arrears of rent for the years 1960 and 1961 to be reduced by half.

Terre Rouge

174. The distribution of irrigation water among the tenants was far from satisfactory although the supply of water was very regular. This was mainly due to disputes between the tenants on such matters as encroachment of boundaries, trespass and distribution of irrigation water.

The Vale, La Cave and Belle Vue

175. The tenants of these settlements maintained a satisfactory standard of cultivation. Climatic conditions were unfavourable during the last quarter and in consequence the harvest was disappointing. The tenants of La Cave renewed their request to plant their holdings to sugar-cane; their request could not be entertained.

Palmar

176. All unoccupied holdings were leased. Owing to the dry conditions prevailing in the region, the yields of foodcrops, vegetables and sugar-cane were poor. Representations were received from some tenants to have dwelling houses constructed for them. The Central Housing Authority was asked to examine the proposal and a site was inspected.

Bee Manique

177. At the end of the year, seventy-five holdings were occupied. Applications for the lease of additional holdings were received.

Plaisance

178. The rent of holdings was reduced by 50 per cent. By the end of the year, all the holdings were occupied. The land is leased solely for foodcrop production. Although climatic conditions were not very favourable for foodcrops, a number of tenants harvested quite satisfactory crops of tomatoes, bananas and pine-apples.

XVI. Extension Services

Visits to Plantations

179. Improved crop husbandry to ensure better yields and higher incomes to small farmers continued to be the main concern of the extension services. Rational use of fertilizers, control of pests and diseases, use of improved varieties of crops and soil conservation measures were the main agricultural problems on which advice was tendered and some 9,223 field visits were paid to farmers.

Demonstration Work

180. Fifty-one demonstrations on the correct use of fertilizers were carried out on farmers' lands, both on sugar-cane and foodcrops. Significant differences in yields in favour of complete fertilizers were again demonstrated.

181. A few demonstrations on the chemical control of weeds were carried out in the fields of some cane growers who were anxious to use weedicides for the eradication of particular weeds from their cane fields.

182. Two hundred and thirty demonstrations on the control of pests and diseases were conducted on farmers' crops.

183. One hundred and forty-six evening meetings of small farmers were convened throughout the island in the course of which lectures on various agricultural topics were delivered and agricultural problems discussed. The lectures dealt mainly with:—

(a) The use of complete fertilizers in sugar-cane and other crops;

(b) The control of pests and diseases;

(c) Potato cultivation, use of certified seed and preventive measures against blight;

(d) Better utilisation of available land and soil conservation measures;

(e) The desirability of growing more fruit trees.

A large number of lectures dealt with the proper use of fertilizers in cane plantations as a special effort is being made to raise the yields of small cane growers. The lectures were sometimes followed by slide projections, film shows and demonstrations.

Propagation and Distribution of Cane Varieties

184. To demonstrate the performance and behaviour of the new commercial varieties under different conditions of soil and climate and to provide canegrowers with healthy cuttings in small quantities, propagation plots were maintained at the various district demonstration centres. Disease-free cane cuttings for the establishment of these plots were obtained from the central cane nursery at Pointe-aux-Sables. 11,277 canes of the new varieties M 253/48, M 202/46 and M 93/48 were distributed from the district demonstration plots. The varieties M 93/48 and M 202/46 are being extended by small planters in the humid and super-humid zones while M 147/44 remains the main variety in the drier regions.

Cane Nurseries for Small Planters

185. With the object of improving the generally low standard of planting material used by small planters and also of providing them with improved facilities in the supply of new cane varieties, the Sugar Planters' Rehabilitation Fund Committee decided to set up a service by which the sugar-cane planters would be supplied with specially produced planting material from a seed producing station. Thus a cane nursery was set up towards the end of 1957 at Pointe-aux-Sables. The choice of site was guided by the following factors:—

(a) Climatic conditions of the north-western sector of the island supplemented with irrigation facilities were favourable to the germination and rapid growth of sugar-cane;

(b) Soil conditions, although very rocky, were suitable;

(c) Irrigation water was available from the Magenta-La Ferme irrigation system;

(d) The uncultivated area available was suitable for development.

186. 150 arpents of scrub land were purchased from Grande Rivière Estate. Subsequently, three adjoining lots of land of 25 arpents, 155 arpents and 50 arpents were also purchased. The first nursery was planted in 1958 and subsequently the acreage under cane has been as follows:—

	Arpents
1958	15.22
1959	65.55
1960	24.95
1961	22.25
1962	47.40
1963	117.00
TOTAL ...	292.37

DISPOSAL OF CANES PRODUCED ON STATION

Year	*Planting material sold*	*Planting material used for nursery*	*Canes sent to factory*	*Total*	*Area cropped*
	Tons	Tons	Tons	Tons	Arpents
1959	266.1	119.2	497.5	882.8	22.81
1960	578.0	67.0	592.0	1237.0	66.04
1961	337.5	95.0	1532.5	1965.0	91.50
1962	568.5	181.0	2596.5	3346.0	114.27
1963	2803.5	421.4	2064.9	5289.8	161.65

187. A large proportion of the planting material sold has been supplied to larger planters and millers, the small planters having not yet taken full advantage of this service for the following main reasons:—

(a) No active campaign has yet been made to induce small planters to obtain their supply from the nursery as the latter could provide at the various stages of its development only a small proportion of planters' requirements;

(b) Many planters, although aware of the facilities offered by the nursery, were loath to incur the expense involved as well as the cost of transport of the cuttings to their plantations.

OCCURRENCE OF PESTS AND DISEASES

188. Bacterial wilt and Late Blight remained the major diseases affecting tomatoes and potatoes. Late Blight proved extremely difficult to control on potato plantations during the early months of winter, owing to a continuous spell of rainy weather. Fortunately the disease appeared when the early potato plantations were reaching maturity and on the whole satisfactory yields were obtained.

189. Severe attacks of scab on squash were also noted on the central plateau during the winter months, whilst powdery mildew and mosaic remained troublesome as usual on squash and other cucurbits.

190. The dry season prevailing in the second half of the year resulted in an increased activity of insect pests. Fruit flies, caterpillars, aphids and mites occurred more frequently and were effectively controlled by the timely use of insecticides.

191. A severe outbreak of *Plusia* sp. and *Prodenia* sp. caused heavy damage to potato crops in the north in the month of June. Some 130 arpents were affected and control measures were carried out by the extension services with the help of the mobile spraying unit.

192. An unsual incidence of red locusts affected small growers' cane fields in various localities of the island during the early months of the year. Severe localised outbreaks were recorded in the districts of Rivière du Rempart, Flacq and Plaines Wilhems, while mild attacks occurred in the districts of Pamplemousses and Moka. Spraying with aldrin and dieldrin had to be resorted to and the outbreaks were effectively controlled. About 155 arpents of cane fields were sprayed under the direct supervision and control of extension officers and once again the mobile spraying unit proved of value.

Weed Control in Sugar-cane Fields

193. Necessary advice and help were given to those cane growers who were desirous of using weedkillers for the control of particular weeds in their cane fields.

Foodcrop Production in Interrows of Cane

194. Through the impetus given to production by the subsidisation of cercified potato seed, a large acreage of cane interrows was devoted to potato cultivation. Both in the north and in the south, potato crops were almost entirely confined to cane interrow. On the central plateau, some growers cropped ratoon cane interrows on a large scale with potatoes, peas and squash. Some 60 experts of cane fields were planted with potatoes in Moka district, mostly in the region of Nouvelle Découverte, and the yields proved to be very good.

Permanent District Demonstration Plots

195. In continuation of the policy adopted in preceding years for the running of the district demonstration plots, a high proportion of the available acreage was planted with sweet potatoes, manioc, groundnuts, bananas, pineapples, promising varieties of fodder grasses and acacia, in order to supply the increasing demands for planting material.

196. Vegetables were grown from acclimatised seeds produced by the Department so as to acquaint planters with the characteristics of the various strains and the method of growing vegetable crops by using seedlings raised in soil blocks compared with the current method of sowing *in situ* and thinning out.

Arsenal Demonstration Plot

197. 5,674kgs of foodstuffs were produced. 4,950 canes of the new commercial variety M 253/48 were distributed to cane growers, and 5,060 kgs of canes were sent for milling. One cow, three rabbits, twelve two-month old chicks, one Anglo-Nubian buck and one doe were introduced on the station. Some of the budded orange planted in 1962 have started to bear.

Mapou Demonstration Plot

198. 5,898 kgs of foodstuffs were produced and 500 canes of the variety M 31/45 and 650 cuttings of the variety M 253/48 were distributed to cane growers. 19,150 kgs of canes were sent for milling. Animals on the station were a cow, a calf, two adult Anglo-Nubian does and one buck, two young Anglo-Nubians, twelve laying hens, one cockerel, five rabbits and thirteen rabbitlings, nine of which were sold to farmers for breeding purposes. Some of the budded orange planted last year have commenced to bear.

Vacoas Demonstration Plot

199. Vegetables and foodcrops were intensively cultivated and 20,570 kgs of foodstuffs were produced.

Rivière des Anguilles Demonstration Plot

200. 8,986 kgs of foodstuffs were produced, 1,907 canes of the new commercial varieties were sold as planting material and 6,840 kgs were sent to the factory for milling. The cow on the station gave birth to a bull calf and the Anglo-Nubian doe to a buck. Three does belonging to farmers were sired by the Anglo-Nubian buck kept on the station. White Leghorn chicks and rabbits were introduced. Vegetable seeds and fruit trees continued to be on sale.

Central Flacq Demonstration Plot

201. The station was officially opened in September, and a successful agricultural show was held on the inauguration day and the two days following. About 5,000 members of the public visited the show.

202. 4,083 kgs of foodstuffs were produced and 4,175 canes of the new commercial varieties were sold as planting material to cane growers. A cow, an Anglo-Nubian buck, a pair of rabbits and a few laying birds have been placed on the station for demonstration purposes. The pit silo which was emptied during the middle of the year, was refilled in October.

Plaisance Demonstration Plot

203. 10,058 kgs of foodstuffs were produced, 12,020 kgs of sugar-cane of varieties M 253/48 and M 31/45 were sent for milling after distribution of planting material to small planters. The different varieties of grasses introduced on the station provided fodder for the animals on the station. The pit silo was emptied in May and refilled in October.

204. The cow introduced on the station in 1962 was replaced by the heifer from Rivière des Anguilles Demonstration Plot. Three does belonging to farmers were sired by the Anglo-Nubian buck kept on the station. One doe and a few laying birds were introduced for reproduction and demonstration purposes. Seeds and plants were on sale for the benefit of farmers in the vicinity.

205. The buildings were completed and the quarters were occupied by the respective officers and labourers.

Assistance to Small Growers

206. Under the Certified Seed Potatoes Subsidisation Scheme, registration of potato growers was carried out throughout the island. 1,556 permits were issued and 715 tons of seed potatoes were allocated. About 850 arpents of land, on which planters proposed to grow potatoes, were visited prior to delivery of permits and, after delivery, to ascertain that the seeds had been planted. On the whole yields were better than last year and the scheme has contributed considerably to a regular supply of potatoes on the local market at reasonable prices.

207. The potato spraying scheme continued to operate successfully; 122 arpents of potato plantations were sprayed as a preventive measure against blight. It has been noted that more and more planters are purchasing sprayers as they become more conscious of the importance of timely control of pests and diseases in order to secure good crops.

Agricultural Teaching in Primary Schools

208. In conjunction with the school authorities, it was decided that gardening activities in a certain number of schools would be resumed, the extension service providing the necessary advice. 14 school gardens were chosen, a list of requirements for the proper running of these gardens was drawn up. The selected school gardens were run satisfactorily.

Control of soil erosion

209. Soil conservation measures on sloping land have become more prevalent on estates and small growers' farms. Assistance was given to sugarcane farmers in laying out their fields on the contour prior to furrowing.

Broadcast Talks

210. The following broadcast talks were given by officers of the Department:—

1. Les progrès réalisés par la recherche dans la culture du tabac à Maurice (L. Suzor—Agronomist);
2. Fodder Production (B. D. Roy—Senior Agricultural Officer);
3. Citrus Growing in Mauritius (J. H. Julien—Horticulturist);
4. L'Usage des pesticides en agriculture et les précautions à prendre (K. Lutchmeenaraidoo—Senior Agricultural Officer);
5. La Culture des Arbres Fruitiers (J. H. Julien-Horticulturist);
6. Avian encephalomyelitis (Dr. J. D. Shuja—Senior Veterinary Officer).

Liaison with the Mauritius Sugar Industry Research Institute

211. One notable feature has been the close contact maintained between officers of the extension service and those of the Mauritius Sugar Industry Research Institute throughout the year. The following lectures delivered by specialist officers of the Institute were attended by officers of the extension service: —

Date	*Lecturer*	*Subject*
24. 1.63	Dr. P. O. Wiehe	Series of talks to be delivered by Research Workers of the Mauritius Sugar Industry Research Institute.
21. 2.63	P. Halais	Foliar Diagnosis.
29. 3.63	G. Mazery	Irrigation.
26. 4.63	F. George	Cane Varieties.
23. 5.63	Dr. P. O. Wiehe	Les travaux de l'Institut de Recherches en 1962.
30. 5.63	J. R. Williams	Les sauterelles et la canne à sucre à Maurice.
31. 5.63	R. Antoine	Control of Cane Diseases.
28. 6.63	D. H. Parish	Fertilization.
26. 7.63	J. D. de R. de Saint Antoine	Cane Analysis.
30. 8.63	E. Rochecouste	Phytotoxicity of Herbicides.
27. 9.63	G. Rouillard	Cultural Methods.
25.10.63	J. R. Williams	Insect Pests.
17.12.63	J. R. Williams	La lutte contre les Sauterelles (Pamplemousses).

Foliar Diagnosis

212. Conditions were unfavourable and in consequence no foliar diagnosis was undertaken.

Plaisance Local Production of Foodstuffs

213. The orange trees planted in May 1961 were allowed to bear a few fruit in order to assess quality. In addition to the 2A67 planted to budded oranges, 2A75 were put under coconuts of Pemba and Malayan Dwarf varieties and 2A45 were planted with litchi layers from selected mother plants. Some 2,400 rough lemon seedlings were planted as stock and about 600 of them were budded.

214. Onion seedlings of the 12 promising varieties, which were tried last year, were raised and planted to assess yields and keeping quality, but the dry conditions which prevailed during the season affected the result of the experiment. Sugar-cane, which had been planted as a windbreak in 1959, was removed and replaced by acacia. The following were planted for seed production: tropical cauliflower, brède de chine salée, pomme d'amour (Bacterial wilt resistant and other varieties), beans (local red and Victory), lettuce (Craquante d'Eculy, Webb's Wonderful and Sucrine), water melon, pumpkin, pipengaille and calabash.

215. An abandoned mango orchard, occupying an area of about four arpents, was brought back into production after thinning, clearing and manuring so as to provide seed. It is estimated that about 25,000 fruit, mainly of the Maison Rouge variety, will be available by the end of the season for propagation.

Miscellaneous

216. The " Produce More Food " Campaign continued in the villages of Case Noyale, Bambous, Montagne Blanche, Bel Air Rivière Sèche, Morcellement St. André, Pointe aux Piments, Belle Vue Maurel, Espérance Trebuchet, Mare d'Albert, Escalier, Bois Chéri, Stanley and Bassin. Local Committees in the villages met at regular intervals and weekly visits were made by extension officers.

217. More than 800 fruit trees were planted and over 1,400 chicks were reared in the various villages. Planting material of manioc, sweet potato, elephant grass and pangola were also distributed. Four Anglo-Nubian bucks, which were sold to breeders for the improvement of the local breed of goats, performed well; more than 100 does were sired. About 15 young bulls were castrated for beef production and rabbits for breeding were distributed. About 20 kitchen gardens were run with the help and advice of extension officers.

218. To commemorate the " Freedom from Hunger " Campaign, 108 fruit trees were distributed and planted in the yards of schools and Village Councils in 96 localities throughout the island.

219. Fourteen silo pits filled last year were opened. In general, the quality of the silage was better than last year and cowkeepers in certain localities have shown increased interest in feeding ensiled cane tops to their stock. The pits emptied were refilled in October—November.

220. Various surveys were conducted during the year including:—

1. Assessment of Crown Lands for rental value and suitability for agricultural development;
2. Assessment of damage done to crops by indiscriminate use of weedicides;
3. Investigation of fodder problems;
4. Collection of statistical data for acreage harvested under foodcrops;
5. Submission of weekly returns of market prices;
6. Lectures, demonstrations and advice to members of Young Farmers' Clubs.

XVII. Foodcrops

221. The following tables were prepared from data collected by the Extension Service :—

AREA HARVESTED (ARPENTS)

Year	*Maize*	*Manioc*	*Arouilles*	*Sweet Potatoes*	*Groundnuts*	*Irish Potatoes*	*Beans & Peas*	*Pineapple*	*Brinjal*	*Tomato*	*Ginger*	*Creepers*	*Mixed Vegetables*	*Total*
1962	317	145	131	250	338	840	900	58	500	2,500	134	1,149	1,412	8,674
1963	271	149	150	134	353	928	817	103	327	2,354	114	1,305	1,441	8,446

ESTIMATED AVERAGE YIELD (KGS/ARPENT)

1962	700	3,480	3,671	4,451	1,011	4,500	1,200	3,393	4,054	2,712	6,000	7,000	9,000	—
1963	543	4,053	4,622	5,239	1,263	5,376	865	4,073	5,986	2,421	6,471	7,418	7,171	—

ESTIMATED TOTAL PRODUCTION (METRIC TONS)

1962	222	505	481	1,113	342	3,780	1,080	197	2,027	6,780	804	8,043	12,708	38,082
1963	147	606	693	702	446	4,989	706	420	1,957	5,698	738	9,681	10,335	37,118

The above area shown is effective acreage and includes the aggregate acreages of different crops grown on the same land in one year, as well as foodcrops interplanted with sugarcane. The following figures for 1962 were amended as hereunder :—

Estimated Average Yield (Kgs/Arpent) :—

Brinjal ... ... 4,054 instead of 1,076

Estimated Total Production (Metric Tons) :—

Sweet Potatoes ... 1,013 instead of 583

Brinjal ... ... 2,027 instead of 538

Total ... ... 38,082 instead of 36,063

XVIII. Experiment Stations

Curepipe Experiment Station

Development

222. One and a half acres of scrub land, adjacent to two streams flowing through the station, were cleared and planted with fodder. All the existing drains were cleaned and where necessary deepened. 230 feet of new drains were dug. The existing roads on th station were improved and re-surfaced. 1,325 feet of new roads were constructed. A concrete bridge, 8 feet long and 14 feet wide, was also built across a tributary of the river Daguet. The compost shed and the two demonstration cowsheds were repaired and the roofs re-thatched.

Fodder

223. The following species of imported grasses and legumes were under test during the year:—Slender Guinea, *Chloris gayana* (Giant Rhodes, *Paspalum notatum, Panicum coloratum, Panicum mackarikariensis, Desmodium ovalifolium, Brancharia Brizantha,* Yellow Lupin (Weike strain), Yellow Lupin S.E.I., *Lupinus augustifolius, Sorghum* sp. (Columbus grass), Sorghum *vulgare,* (velvet sorghum), Poona Cowpea (fodder type), *Alysicarpus glumaceous* (Alyce clover), Louisiana Red Clover, Louisiana White Clover, *Trifolium semipilosum* (K 5154) and Hubam Clover. *Bracharia Brizantha, Panicum mackarikariensis, Panicum coloratum* and *Paspalum notatum* have shown most promise.

224. The randomised block experiment laid down in September 1961 to test the three most successful grass species at Curepipe was continued. Four cuts were taken during the year and the yields were as follows:—

	kgs.
Setaria sphacelata (selected)	30,653.9
Pennisetum purpureum	22,476.8
Chloris gayana (Endebess)	17,853.4

225. Three species of grass were planted in randomised blocks and night grazed to determine their yield and palatability under grazing conditions. Yield before grazing was estimated by means of quadrats. Grass left over was cut and weighed. Only two grazings were possible because the batch of animals were taken indoors for calving. Results were as follows:—

	Kikuyu	*Pangola*	*Setaria*
	Kgs	*Kgs*	*Kgs*
Calculated yield/acre	7,487.5	10,275.0	18,675.0
Calculated weight of wasted fodder per acre	499.0	601.0	853.5
Calculated weight of fodder grazed per acre	6,988.5	9,673.5	17,821.5
Percentage of fodder grazed	93.3	94.1	95.4

226. In an observation trial *Setaria sphacelata* and *Chloris gayana* were planted together in equal proportions and as expected *Setaria sphacelata* completely chocked out the *Chloris gayana.* The selection of *Setaria Sphacelata*

for winter growth continued and selection of *Panicum maximum* (Sigor) was commenced at Curepipe and Plaisance experiment stations. A fertilizer experiment with 2 levels each of N, P and K and CaO on selected *Setaria* was laid down.

227. Fodder was supplied throughout the year to the livestock breeding station, Curepipe, at the rate of five tons per day from the Curepipe and Plaisance stations supplemented with fresh cane tops during the harvest and cane top silage.

Orchard Crops

228. The citrus orchard recovered somewhat from the effects of cyclones during recent years. A few Mandarin plants flowered and produced fruit. Several budded oranges also flowered but, with the exception of a Valencia orange, no fruit was set. 12 Florida Rough Lemon plants for seed production and 14 " Clementine " grafts were added to the orchard.

229. A time of planting trial with three types of planting material, namely corm, sword, and suckers, using the banana variety Naine was laid down. Planting took place in the first week of each of the months of February, May, August and November. By the end of the year, young suckers had made the best growth followed by plants from the ' corm ', the ' sword ' showing least growth.

230. All the guava plants in 1962 produced fruit. Kaki seedlings, planted 4 years ago, flowered and set fruit for the first time in October. Six grafts of each of the following 5 imported varieties of Kaki were planted in July:— Mazeli, Guibochi, Tane Mashi, Tippo and Zendye. All the plants grew well and in October flowered and set fruit. Unfortunately, all fruit of Kaki, whether on seedlings or grafts were shed by the end of the year. The apple trees var. " Tropical Beauty ", planted in June 1962, grew satisfactorily and flowered for the first time in mid-October.

231. In January 1963, 50 seedlings of each of the two coffee varieties Excelsa and Arabica were planted. Several of the plants of the Arabica variety flowered in October.

232. The two strains of raspberry, e.g. Malling Jewel and Norfolk Giant, planted at Curepipe in December, 1961 and which had subsequently suffered from cyclones, recovered and produced a good number of young shoots, a few of these were transplanted with 50 per cent success in July. Neither variety flowered during the year.

Foodcrops

233. A 3×3 factorial trial on *Colocasia esculenta* (Arouille carri) with 3 levels of N, P and K of O, 30, 60 lbs/acre was planted in April and harvested in December. There was no significant difference in the treatments but the higher level of potassium indicated a depressing effect on yield.

234. A randomised variety trial with 7 varieties of beans with 4 replicates was planted on the second of August and the marketable green pods harvested in mid-October. The plantation suffered from *Agromyza* attack. The results were as follows:—

Variety of beans	*Mean yield acre (kgs)*
Long Tom	1,448.8
Fin de Bagnol	1,053.5
Golden Queen	698.8
Pioneer	696.3
Prolific Long-podded	526.1
Victory	492.1
Oeil de Précoce	401.8

L. S. D. 5% : ±685.3 kgs/acre
L. S. D. 1% : ±938.7 kgs/acre

235. Two variety trials with the 5 varieties of potatoes were planted on the third of June and the twenty-first of July. The yields at harvest on the sixth of September and twenty-fifth of October respectively were as follows:—

June planting

Variety	*Yield / Acre (kgs)*
Kennebec	4,512.0
King George	4,414.5
Ackersegen	3,510.0
Pentland Ace	3,115.5
Delaware	1,573.5

L. S. D. P=0.05 : 1073.3 kgs/acre
L. S. D. P=0.01 : 1529.9 kgs/acre

July planting

Variety	*Yield / Acre (kgs)*
King George	6,484.0
Ackersegen	5,408.0
Kennebec	4,122.0
Pentland Ace	3,704.0
Delaware	3,238.0

L. S. D. P=0.05 : 1363.6 kgs/acre
L. S. D. P=0.01 : 1943.7 kgs/acres

The varieties Askersegen and Pentland Ace were more resistant to blight than the other varieties and Delaware was the most susceptible.

236. Potato tubers intended for storage were treated in November with the fungicides Aretan and Captan. At the end of December, no difference was perceived in the treated tubers as compared to the untreated tubers.

237. A randomised block spacing trial on maize with 4 replicates was planted on the nineteenth of March and harvested on the twenty-eighth of October; the following calculated yields of maize grain per acre were obtained:—

Treatments	*Yield / acre* Kgs
Holes spaced 3′ × 1′ with 1 plant per hole ...	1,200.1
Holes spaced 3′ × 1′ with 2 plants per hole ...	1,028.8
Holes spaced 3′ × 2′ with 2 plants per hole ...	908.9
Holes spaced 3′ × ¾′ with 1 plant per hole ...	1,112.9

L.S.D. P=0.05 : 342.4 kgs/acre
L.S.D. P=0.01 : 491.9 kgs/acre

238. A fertilizer trial on maize comparing the effect of 20 kgs of N, applied in the hole at planting with 10 kgs of N applied at planting and the remaining 10 kgs when the plants reached knee height, was planted on the

seventeenth of April at a spacing of 3′×2′ with 2 plants per hole and harvested on the twenty-third of October. P and K were applied at planting at the rate of 20 kgs per acre of P_2O_5 and K_2O respectively. Results were as below:—

Treatments	*Average yield of grain per acre*
	Kgs
20 kgs N at planting	674.4
10 kgs of N at planting and 10 kgs later ...	1,029.0

239. A 3×3 factorial fertilizer experiment on cauliflower was carried out during the winter. Seedlings in soil blocks were planted at a spacing of 2½′×2′. 15 tons of farmyard manure per acre were applied. The levels of N, P and K applied at planting on the seventeenth of July were as follows:—

	Kgs/acre
N	0, 30, 60
P_2O_5	0, 20, 40
K_2O	0, 20, 40

Harvesting took place over the period seventh of September to seventh of October.

240. Nitrogen had a significantly favourable effect on growth and production of curds; there was no response to phophorus or potassium.

241. Seeds of various vegetables, including squash (var. Golden Custard), pumpkin, calabash, cucumber and pipengaille were produced for sale to the public.

Livestock

242. Ducks and geese were kept on the fish ponds as in previous years. The geese grazed on the banks and thus helped to some extent in the upkeep of the fish ponds. Both types of birds were reared economically and the size of the flocks increased. Several birds were sold to the public. The production of duck eggs increased and about 90 per cent of the production was sold.

Fresh Water Fisheries

243. A fish pond, on which ducks and geese were kept, was treated with slaked lime at the rate of 150 kgs per acre and single superphosphate at the rate of 100 kgs per acre in January, 1962. In February, it was stocked with fingerlings, 5 to 8 cms long, of *Tilapia nilotica* and *Tilapia macrochir* at the rate of 1,000 fish of each species per acre. The pond was drained in December, 1963 and the following calculated yield per acre of fish was obtained:—

	Kgs.
Mixed fingerlings up to 10 cms.	193.4
Fingerlings 10–15 cms. long (mixed)	221.0
Tilapia nilotica (marketable size)	255.9
Tilapia macrochir (marketable size)	191.4
Total weight of fish/acre ...	861.7

244. *' Catla catla '* fry received from India in September, 1961, were measured in November, 1963 and were found to weigh just over 2 kgs each. In September, 1962, more *' Catla catla '* fry were received from India, as well as some fry of *' Labeo Rohita '*. These too have grown satisfactorily and in November, 1963, they were found to weigh approximately 1 kg each. No *' Catla catla '* or *' Labeo Rohita '* had reproduced up to the end of the year.

Reduit Experiment Station

Development

245. The clearing and bulldozing of 10 acres of land, acquired from Le Reduit grounds, was commenced. This additional land is required to permit the use of part of the station for practical work by the students of the College of Agriculture.

Orchard Crops

246. The fertilizer experiment started last year on the young citrus as well as on citrus at full bearing continued. Routine spraying with rogor and zineb against mite attack on the fruit was carried out. Fruit set has been very good; irrigation as required has been carried out to prevent fruit drop.

247. Six imported grafts of each of the varieties of peach and persimon from South Africa were planted at Réduit for observation. Papaw seeds from various sources, suitable for fresh consumption and crystallisation, were imported for trial.

248. The collection of nine varieties of bananas, namely Naine, Ollier, Kisukari, Tahiti, Mille, Faux Gingeli, Nouvelle France, Philibert, and Hybride Ducasse was maintained. The variety trial with Naine and Ollier continued.

Grasses and Legumes

249. A variety trial was laid down with the local and five imported varieties of acacia. From results so far obtained, all the imported varieties proved superior in yield and leafiness to the local type. The variety Guatemala was outstanding, with yields nearly 200% above the local variety.

250. An experiment was carried out to study mixed planting of each of the four most successful legume species with each of the four most successful grass varieties at Réduit, namely Giant Rhodes, Slender Guinea, Pangola and Elephant grass. *Desmodium* has proved very satisfactory; it has shown very vigorous growth with all the grasses. Sinatro, Lotononis and Kudzu have either grown very poorly or not taken.

251. The Pangola grass nitrogen trial confirmed the large effect that nitrogen has on increasing yield. The P and K dressings were standard and nitrogen was applied at various levels after each cut. Over a one-year period, green matter yields in tons per acre were as follows:—

No. Sul of ammonia	100 lbs	200 lbs	400 lbs
9.8	17	22.5	31.7

252. Records of yields from the Rhodes grass phosphate experiment with triple superphosphate at 80, 160, 240 lbs per acre per year indicate that the highest level of phosphate has a depressive effect on the growth of this grass.

253. The station supplied fodder to the livestock division during the sugar-cane intercrop season. Planting material of slender guinea and pangola were supplied to various farmers. Pangola was also supplied to La Ferme and Palmar for development of pastures and fodder areas.

254. Of the new introductions in 1963, the Poona cowpea and the grass *Bracharia Brizantha* were of interest.

Foodcrops

255. Experiments, carried out with hybrid maize from various sources, were continued and hybrids generally have confirmed their superiority over the local maize.

256. The sweet potato varieties Violet, Joes and Patate Rouge were found to outyield the other varieties tested in a variety trial.

257. A variety trial with six varieties of groundnuts, namely Cabri, Manipintar, Makulu Red, Katumani 971, Njugu Machan No. 69, Katumani 972, was carried out. All the varieties outyielded Cabri by 20 %, Makulu Red and Manipintar being outstanding with yields of over 50% compared with Cabri.

258. A variety trial on Cassava was carried out with Manioc Blanc, Constantin, Manioc de Table, Australia, Nestor and Paloma. Blanc and Constantin gave superior yields to Manioc de Table, the former by over 25%. The variety Constantin has a bitter taste which makes it unsuitable for human consumption.

Barkly Experiment Station

Development

259. The eight acres of land taken over from the Prisons Department was bulldozed and will be cropped in 1964. Installation of mains for overhead irrigation is in progress. The area has been partially fenced. A new electric multi-stage high pressure pump is being installed. The installation of the new Mac Penny mist propagator and weaner unit was completed.

Seed Production

260. The area devoted to seed production was as follows: 26 acres at Barkly, 8 at Plaisance, 2 at Abercrombie Nursery, 8 at Richelieu and 4 at Reduit. The revenue derived from sales of seeds and plants was as follows:

	1961	*1962*	*1963*
	Rs	Rs	Rs
Seeds	22,647	28,451.84	27,796.55
Plants	15,041	13,645.95	28,128.73
Total ...	37,688	42,097.79	55,925.28

The above figures include produce given free to Government Departments which in all amounted to the value of Rs 7,510.26. The increased revenue from sale of plants is due in part to the " Produce More Food " Campaign.

Orchard Crops

261. As a result of the higher percentage takes when orange varieties are budded on to stocks of citron galeux and Florida Rough Lemon compared with bergamotte and bigarade seedlings when used as stocks, the latter two stocks were found unsuitable. Budding of citrus stocks was carried out at Barkly and Plaisance. There was a shortage of bud wood by the end of the season. 4,834 stocks were budded at Barkly with orange and grapefruit varieties and 2,752 took; at Plaisance 2,022 were budded and 917 took. During the year, 1,926 budded orange plants were sold to the public.

262. Citrus orchards established at various stations were satisfactory, the Plaisance orchard making the most progress. The fruiting at Plaisance was most satisfactory.

263. Because of cyclone Beryl in December, 1961, mango seedlings were scarce and consequently production of grafted and seedling mango plants during the year was small.

264. Some 5,000 coconuts were again imported from Malaya and planted in nurseries in May. The number germinating was satisfactory at 70% and 1,200 seedlings were sold to the public by the end of the year.

265. About 1,500 root cuttings of breadfruit were rooted in the solar propagator as the mist propagator has not proved itself superior for breadfruit propagation.

266. 2,200 litchi layers were prepared using a polythene cover and moist peat as medium and 1,890 plants were sold.

267. A new imported variety of grape "The Coudrec 13" from Madagascar has been planted at various stations to assess yield and quality.

Vegetable and Foodcrops

268. A fertilizer trial on cabbage showed that there was no significant response to phosphate or potash; nitrogen at 30 kgs. and 60 kgs. per acre gave significant increases in yields, with no significant difference between the latter two treatments.

269. A variety trial with onions showed that the varieties Early Lockyer White, Yellow Bermuda, Hunter River Brown were better yielders than the "Onion local" and their keeping qualities were satisfactory.

270. The tomato varieties Southern No. 3 and tomato Marglobe proved to be more bacterial wilt resistant than the local "pomme d'amour" and are also better yielders.

Abercrombie Nursery

271. The grape variety "Napoleon Chasselas," imported from Réunion, again gave a good crop of good eating quality grapes. The mango orchard is well established and will be a much needed new source of budwood in the future. The citrus orchard is progressing satisfactorily. Sale or plants from this station was satisfactory.

The Royal Botanic Gardens, Pamplemousses

272. The nursery continued to play a major role in the propogation of ornamentals and fruit trees to meet the ever increasing demand from the public. Most of the plants for the replanting, following cyclonic damage and recruiting of the centre island of the trunk road were met by the nursery. Some 1,000 Pemba coconuts from the Gardens and Pamplemousses experiment station were planted during the year. *Ficus elastica*, for which there is a keen demand, was propagated solely at the Gardens. Some 800 citrus plants were budded and offered for sale.

273. The Gardens continue to be supported by the public; it is estimated that about 120,000 people visited the Gardens during the year.

Richelieu Experiment Station

Development

274. An area of 40 acres, formerly under *Fucraea* is being reclaimed. Funds were provided for the clearing of the area, for bringing in irrigation water from La Ferme distributory canal, a distance of 1,600 feet and for the installation of a portable sprinkler irrigation system.

275. In order to protect the station from being flooded and eroded by water coming from Petit Malabar hill during heavy summer rains, the existing storm drains were broadened and new catchment drains dug. Most of the area being reclaimed is good agricultural land but, as the slope exceeds 5 per cent in many parts, graded terraces and other appropriate soil conservation measures will have to be established.

276. The irrigation water will be conveyed through an underground 10″ asbestos cement pressure pipe so as to enter the highest part of the area with a head of 115 feet. This should give sufficient head to work a semi-portable sprinkler irrigation system at a pressure of 35 lbs p.s.i. with a rate of application of 0.2″ per hour. The 10″ supply line will be linked with the existing system of reservoirs and underground mains of the station to supply additional water under pressure for sprinkler irrigation of the whole station.

Tobacco

277. Methyl bromide was still being used for the treatment of seed-beds with very good results at Richelieu and Pamplemousses stations. Again a number of nematocides were tried in seed-beds at Richelieu but, as all seedlings including those from the control beds were free from nematocides when they were pulled six and eight weeks after sowing, it was not possible to assess the efficacy of the various nematocides.

278. The seedlings from the beds treated with methyl bromide were the most rapid, uniform and vigorous. All the other nematocides tested suffer from the disadvantage that a period of at least two weeks must elapse between treatment and sowing. Treatment with methyl bromide lasts only 48 hours and sowings can be done immediately after treatment. Methyl bromide was also a very efficient herbicide whereas some of the other nematocides appeared to encourage weed growth.

279. In addition to the seed-beds raised for planting the experimental fields at Richelieu and Pamplemousses, some 100 more seed-beds were sown to provide seedlings to tobacco growers in case of emergency, such as the destruction of seed-beds in the other districts by flood or other cause. However, the growers were able to produce their own requirements of seedlings through proper sanitation and treatment measures. Ethylene dibromide (E.D.B., Nematox) and sodium methyl dithiocarbamate (Vapam, Unifume) were in general use as nematocides by tobacco growers. Zinc ethylene bisdithiocarbamate (Zineb, Murphane) was still the main fungicide and D.D.T. and Rogor-40 the main seed-bed insecticides in use by growers. Supplies of these products were obtained by producers from the Tobacco Board which carried adequate stocks of all chemicals approved for use in the tobacco industry.

Release of new Varieties

280. Yellow Mammoth and Bonanza are still the principal flue-cured Virginian varieties grown on a commercial scale. Strains highly resistant to the main soil diseases, particularly Black Shank, *Phytophthora parasitica* var. *nicotianae*, developed at the station, were responsible for the continuous improvement in yield and quality obtained by tobacco growers. In 1962, for instance, the average yield for the island was over 1,200 lbs per acre with 85% of bright grades and many growers, who had favourable weather conditions or were able to irrigate their crops, recorded yields of over 2,000 lbs per acre. The production of high yielding varieties is one method whereby the cost of production of tobacco can be decreased.

281. Three new varieties were tried by growers during the last season, namely Vesta 30, N.C. 73 and Cokers 187. From the results obtained it seems that all the three varieties have good characteristics but that they require improvement by selection and acclimatisation.

282. Some 20 acres of Burley 11B were planted in January by air curers in plots of a quarter acre in the Pamplemousses and Rivière du Rempart areas. A drought which lasted through the whole of February and the early part of March resulted in very little growth. Rains in March and April were too late to improve the growth in the fields and caused poor conditions for the air curing of the leaves. Successful plantings in a few places, where conditions were more favourable, showed that the variety has good yield and quality possibilities. The object of these trials is to obtain a Burley variety capable of replacing Amarello. The latter variety was introduced in 1926 and has become well established, giving yields of over 2,000 lbs per acre.

Interspecific hybrids

283. Four young plants of a *Nicotiana* species were found growing wild at Rivière du Rempart, in the vicinity of a tobacco field. They were transplanted at Richelieu where they showed vigorous growth. They have been crossed with some flue-cured Virginian and Burley varieties.

Fields

284. The flue-cured season, which was exceptionally good for tobacco growers, was marred at Richelieu by heavy attacks of mildew, *Erysiphe cichoracearum* DC, in June to August and again in November—December. All experimental fields were planted in March—April at Richelieu as earlier plantings usually suffer heavily from frogeye, *Cercospora nicotianae* Ell. and Ev., in April—May. The seed production plots planted in April at Pamplemousses did not suffer from mildew. Spraying with the fungicide Karathane, dinitro 1-methyl hepthyl phenyl crotonate, which gave good results in preceding years in cases of mild attack, gave only partial relief during this season when climatic conditions at Richelieu seemed to have been very favourable to the disease. The September—October plantations at Richelieu were made for breeding disease-resistant varieties during the hot dry months at the end of the year.

285. Of the three established varieties and seven recent introductions of flue-cured being selected and tested, all showed considerable resistance to soil diseases except PD 611 which was less resistant to Black Shank although more resistant to nematodes when planted in September.

286. Four of the new introductions, together with two established varieties, were planted in a randomised block experiment at Richelieu in mid-April to test their yield and quality. An attack of mildew prevented a true comparison of the quality characteristics of the leaf. No significant differences were found between the yields of varieties, the average yield of the experiment being 1,200 $\pm$ 22.2 lbs of cured leaf per acre. Incidence of Black Shank was not high in the PD 611 variety planted in April, and that variety yielded 1,325 lbs per acre in the trial.

287. A fertilizer trial in which combinations of two levels each of nitrogen, phosphate and potash were applied to determine their effect on the yield and quality of tobacco, was planted in mid-April. The main effects of nitrogen and potash were almost significant, but the experiment was severely affected by mildew and the average yield was 1,000 lbs per acre.

288. Tests were continued with various insecticides for the control of insect pests in the seed-beds and in the fields. The Burley varieties again suffered more than the flue-cured from the attacks of the leaf miner, *Gnorimoschema operculella* Zell., the bud worm and leaf eating caterpillar, *Heliothis armigera* Hb., and cutworms, *Agrotis ipsilon* Huf, It appeared that these insects were rapidly becoming resistant to most of the systemic insecticides in common use.

Seed Production

289. The station continues to be the sole supplier of seed to all growers of air-cured and flue-cured tobacco. The seed is distributed by the Tobacco Board, free of charge. Tobacco growers pay into the research fund of the Tobacco Board a cess of Re 0.05 per kg of leaf delivered at the Tobacco Warehouse and the Tobacco Board pays Rs 30,000 annually to Government as a contribution towards the work on tobacco carried out by Government.

290. Tobacco seed was produced by mass selection in plots of selected strains of all commercial varieties planted for that purpose. All selected plants have their flower heads bagged. The tobacco seed is cleaned through a seed separator, dried and stored. When required by the Tobacco Board for distribution to growers, the seed is treated with 1 per cent silver nitrate solution and dried immediately before issue. Germination and humidity tests are carried out regularly to ensure seed quality. The station carries ample stocks of seed equivalent to at least two years supply to insure against loss of seedbeds destroyed by floods and/or cyclones.

Curing

291. In spite of the heavy attacks of mildew, sufficient leaf was obtained from the fields to enable a comparison to be made between steam-curing and curing with conventional flues. The steam-curing unit gave good control of humidity conditions in the early part of yellowing of the curing. It was thus possible to bring the temperature rapidly to 100°F with a high relative humidity in the barn with the result that the yellowing period was greatly shortened, even with difficult heavy leaf from the top of the plant. The high temperature and humidity conditions also gave good control of barn spot, *Cercospora* or *Alternaria*. It was also possible to cure satisfactorily leaf slightly infected with mildew. During the middle of the crop, it was found that the amount of perished leaf was about 20 per cent in the case of steam-curing whereas a flue-curing barn filled with similar leaf gave over 80 per cent of perished grades. The steam-curing unit also gave better control of temperature than the flues; the heat was more uniform and could be increased rapidly as necessary. Finally, a better product was turned out by steam-curing.

292. The installation of a steam-curing unit would not be economical for many growers. It is somewhat large for the majority of existing barns. The unit has been designed for a barn 16′ × 16′ by 8 to 9 tiers high, equivalent to 2½ tons of green tobacco. The consumption of fuel was found to be about 2½ cords of firewood per curing. If the unit was installed in a 12′×12′ by 6 tiers high barn taking 1 ton of green leaf, the consumption of fuel would remain about the same. The steam unit requires a supply of electricity for the fan incorporated in the centre of the unit and electricity has not yet reached many of our tobacco growers. A further disadvantage lies in the higher initial capital investment required for such equipment which includes a boiler in addition to the steam-curing unit.

293. In view of the rising cost of firewood, Rs 45 per cord in 1962 compared to Rs 20 or less per cord in 1959, it is considered desirable to investigate the possibility of ' oil-curing ' tobacco. Curing units using oil as fuel and with automatic control of temperature have been in use in many tobacco countries and have been accepted by the trade. The combustion of the oil must be complete, otherwise there is a danger of tainting the tobacco. During the next season it is proposed to try out two oil-curing systems at Richelieu, the direct-fired, in which the heater units are placed directly on the floor of the barn and another system in which the products of combustion of the oil are removed from the barn through flues.

Leaf Production

294. 3,376.9 kgs of flue-cured tobacco were sold to the Tobacco Warehouse from 7½ acres of experimental fields at Richelieu and Pamplemousses, an average of 990 lbs per acre. The gross value of the leaf was Rs 22,506.69, an average of Rs 6.67 per kg of leaf. The leaves from plants selected for seed production were not harvested in order to increase the yield of seeds.

295. Out of the Amarello and Burley seed production plots, small quantities of leaf were harvested from the plants which had not been selected for seed. 340.8 kgs of Amarello of a value of Rs 2.80 per kg and 196.9 kgs of leaf of Burley of a value of Rs 2.77 per kg were sold.

Potatoes

296. Seed of three varieties received from the Union of South Africa, one variety from Australia and another from Kenya were used to plant a variety trial at Richelieu at the end of June. A light attack of blight occurred at the beginning of September and was kept under control by applications of a carbamate fungicide, zineb. The potatoes were lifted at the end of September with the following results:—

	Yields tons/acre ±0.28
King George from South Africa ...	7.55
Kennebec	7.50
Suzanna	8.33
Delaware from Australia	8.77
Pentland Ace from Kenya	6.49

Mean 7.73±0.13

Delaware gave a significantly better yield than King George, Kennebec and Pentland Ace; the latter variety yielded significantly less than all the others. Delaware has been a consistently good yielder in this ecological zone.

297. Another experiment on potatoes planted at the same time, was designed to compare the insecticide thimet, applied before planting, with various insecticides applied by spray during growth for the control of aphids and other insect pests including the tuber moth, *Gnorimoschema operculella* Zell. Incidence of insect pests was almost nil, and the experiment will therefore have to be repeated during the next planting season.

Other Crops

298. Three varieties of dwarf beans were planted at Richelieu and grew well . Plots of other vegetables including lettuce, brinjals, coriander, local tomatoes and peas were also planted for seed production. The results were satisfactory except for the peas which suffered heavily from mildew. All seeds and fruits were sent to Barkly experiment station for cleaning, storage and sale to the public.

299. Maize was grown both for seed and silage. A spacing fertilizer experiment was also planted under limited irrigation conditions at Richelieu. There were four spacings, with interrow spacings at 2 feet two plants per hole, 1 foot one plant per hole, 1 foot two plants per hole, and at 9 inches

one plant per hole, the distance between the rows being 3 feet in all cases. The fertilizer treatments consisted of the application of the whole of the nitrogen at planting or the application of half the quantity at planting and the other half when the plants were knee high. All plots received 100 kgs sulphate of ammonia, 100 kgs of single superphosphate and 50 kgs of sulphate of potash per acre. The spacing treatment of 2 plants at 2 feet in the row gave a yield of $1,892 \pm 122$ lbs per acre which was significantly better than the other spacings. The average yield was $1,410 \pm 61$ lbs per acre. No significant difference was found between the fertilizer treatments.

300. Two fertilizer experiments were carried out on Pangola grass. In the first, the treatments consisted of three rates of nitrogen application, namely 20, 40 and 80 lbs nitrogen per acre once annually, with basic applications of phosphate and potash. In the second experiment, the nitrogen was applied at the rate of 22 lbs per acre after each cut, at 33 lbs per acre four times a year, and at 66 lbs per acre twice a year; the potash was applied half in April and half in October and the whole of the phosphate was applied in May. The yields of grass were much lower than expected.

301. 510.5 tons of canes were harvested from about 16 acres, an average yield of nearly 32 tons per acre. Three acres planted with the Mauritius Sugar Industry Research Institute's seedlings were not harvested.

302. Of the new grasses and legumes introduced for trial, Giant Rhodes and *Desmodium intortum* have become well established.

Orchards

303. The four varieties of budded oranges, planted in October, 1962, have made good progress; they flowered profusely and started to bear fruit in July/August. A second flowering occurred in December. The grafted Marsh grapefruit and the other citrus seedlings, planted in 1959, have also made good progress. Three of the Florida Rough Lemon trees bore fruit; seed was saved from them and was sown at Barkly experiment station.

304. The two grafted apple plants of the variety Tropical Beauty from Queensland, which were planted at Richelieu in October, 1962, also did well and one has started to bear fruit.

305. The mangoes, both seedling and grafted varieties, have made good progress. The varieties Baissac and Maison Rouge were the two best bearers at Richelieu.

Fish Ponds

306. The two, 1/10 acre, fish ponds were stocked with one species of *Tilapia* at the end of 1962; one pond received the liquid refuse of a small cowshed and the other the liquid refuse from a pigsty. *Ipomea reptans,* which had been planted in the ponds, grew very dense in summer and almost completely filled the ponds. The yield of fish in September, 1963, was 1,100 lbs per acre from the pond which had refuse from the pigsty and 800 lbs per acre from the other.

307. It was found that the floor of the ponds allowed considerable quantities of water to seep away over one inch per day. A bitumen coat of 0.1 to 0.2 inch thick is being applied to the floors and sides of one of the ponds. A layer of soil, 4 inches deep, will be placed on top of the bitumen coating and by this means it is hoped to reduce the wastage of water.

Mechanization

308. There was no addition to the mechanical equipment in use at Richelieu. The station is now equipped with an OM-45 crawler tractor for land clearing, subsoiling and construction of drains, Massey-Ferguson 35 tractors for ploughing and other land preparation operations, for interrow work, for planting maize, groundnuts and beans and for operating chaff cutters, blowers and sprayers.

XIX. Plant Pathology

Tobacco

309. Brown leaf spot of tobacco, *Alternaria longipes* (Ell. & Ev.), appeared early at Etoile in an unusually wet November but was effectively checked during a dry December. Frogeye, *Cercospora nicotianae* (Ell. & Ev.), was absent from most plantations.

310. In variety trials PD 611, a variety resistant to rootknot nematodes, proved very susceptible to Black Shank, *Phytophthora parasitica* Dast. var. *nicotianae* (Breda de Haan) Tucker.

311. Declining resistance to bacterial wilt, *Pseudomonas solanacearum* (E.F. Sm.) which had been noticed on Amarello in past years, has also been observed on Yellow Mammoth, the main commercial Virginian variety. The occurrence of an apparently new strain of the bacterial wilt organism, recorded on potato in recent years, may have contributed to the declining resistance of tobacco varieties. Particular attention is being given to the selection for seed production in localities where bacterial wilt occurs.

312. A complex of virus diseases of tobacco was under investigation. Young plantations are affected very early and may show practically 100 per cent infection. Symptoms include stunting, chlorosis, thickening and rolling of the leaves and proliferation of stems with narrow leaves. Control of suspected vectors, by sprays of Roger 40 and precautions in handling in the seed-beds and fields have been recommended. The seasonal incidence of the suspected vectors and the effectiveness and practicability of various spraying schedules are being investigated. The Plant Pathologist spent ten days with the specialist officers of the Tobacco Research Board of Southern Rhodesia to discuss the problem and to study symptoms of virus diseases in Rhodesia.

313. Severe shot hole and shredding of leaves in a small patch in a plantation at St. Julien was caused by a *Phyllosticta* sp.

314. Hole injection with ethylene dibromide against nematodes in the field have given encouraging results.

Tea

315. Sporophores of an *Armillariella* sp., possibly a small form of *Armillariella mellea,* were collected for the first time on tea plants dying from the root splitting disease at Wooton experiment station. Charcoal Stump Rot of tea, which is reported to be the most serious root disease of tea in North-East India and Ceylon, was found on tea plants at Wooton in March. This is the first record of this pathogen, *Ustilina zonata,* on tea in Mauritius. A common saprophyte, *Thyronectria pseudotrichia,* was also found in association.

316. Spotting of tender leaves reported during June has been found to be caused by a *Pestallozzia* sp. following slight bruising by wind.

Potato

317. The incidence of seed borne leaf roll and other virus diseases was lower than in past years. Zineb gave effective control of late blight, *Phytophthora infestans,* even in very wet localities, when the intervals between sprays were appropriately reduced.

Groundnut

318. Severe spotting of leaves caused by *Cercospora* sp. occurred at Réduit and Mapou. The incidence of collar rot caused by *Sclerotium rolfsii* was high at Mapou during February and March.

Beans

319. Bacterial wilt, *Pseudomonas solanacearum,* occurred in several young plantations at Beau Bassin and Black River. This is the first record of the disease on beans in Mauritius.

320. Both halo blight, *Pseudomonas phaseolicola,* and rust, *Uromyces appendiculatus,* were severe throughout the season. A severe outbreak of pod rot, *Sclerotinia sclerotiorum,* in a seed production plot occurred during July and August at Barkly experiment station.

Peas

321. The cause of a poor stand in peas was attributed to a *Fusarium* sp. with mealy bugs in association. A wet rot of stems, leaves and inflorescences caused by *Choanephora cucurbitarum* was very destructive during the wet season at Flacq.

Tomato

322. Gray leaf spot, *Stemphylium solani,* and bacterial wilt, *Pseudomonas solanacearum,* occurred as usual throughout the year. In a trial at Plaisance, bacterial wilt resistant varieties from North Carolina outyielded the local " pomme d'amour " and Marglobe under moderate wilt conditions. The percentage of wilted plants was 11 for both susceptible varieties and nil for the resistant ones. Vapam drenches, at the rate of $\frac{1}{4}$ litre in 2 gallons water per 100 sq. feet, gave good control of bacterial wilt on a notoriously infested plot at Réduit during the dry season. Grafting of tomato on *Solanum torvum* rootstock, immune to bacterial wilt of tomato was carried out on a large scale at Barkly experiment station.

Other vegetables

Chillies

323. Powdery mildew, *Leveillula taurica,* with the bread mite, *Hemitarsonemus latus;* in association, caused severe defoliation to chilli plants and considerably reduced yields.

Cucurbits

324. A severe outbreak of scab or gummosis of squash during August at Vacoas, was caused by *Cladosporium cucumerinum.* The disease was satisfactorily controlled by maneb in a field trial. Downy mildew, *Pseudoperonospora cubensis,* was severe on new varieties of melon, cucumber and marrow. Powdery mildew, *Erysiphe cichoracearum,* was very common. Karathane sprays gave satisfactory control.

Fruits

Pine-apple

325. Side rot of fruits with a *Penicillium* sp. in association and heart rot of plants were common during an unusually dry season. Spraying with captan for control is being investigated.

Citrus

326. Canker was widespread on susceptible varieties. A russetting of citrus fruits has been attributed to damage by mites. Zineb sprays, which have been found to be very effective against mites, were recommended as a control measure.

Azona reticulata

327. Anthracnose caused by *Gloesporium* sp. was very common at Pamplemousses and Mapou during the dry season.

Ornamentals

Roses

328. Powdery mildew, *Sphaerotheca pannosa,* was unusually common during the long winter. Control sprayings with phaltan or karathane have not always given satisfactory results.

Experiments

Tomato

329. In a trial at Arsenal demonstration plot to compare the effectiveness of maneb and zineb sprays in the control of Gray leaf spot, *Stemphylium solani,* on the local tomato, maneb was found to be slightly superior to zineb. Mean yields per plant for the treated and control plots were as follows:—

	Yield / Plant
	lbs
Maneb (2 gm / litre + wetting agent)	5.34
Zineb (2 gm / litre + wetting agent)	4.51
Control	2.05

Groundnut

330. A four-replicate, randomised block fungicide trial was carried out at Réduit for the control of groundnut leaf spots, *Cercospora* sp., with a new fungicide Brestan, 60 per cent triphenyl tin acetate at 3 gm/gallon of water and wettable sulphur, 25 gm/gallon of water. Evaluation of disease control based on yield showed that treatments with either wettable sulphur or Brestan was superior to the control by about 40 per cent. However, Brestan was slightly phytotoxic.

Root disease of Pea

331. Further investigations on a wilt of pea caused by a *Fusarium* sp. with mealy bugs in association were carried out at Réduit and have shown that a seed dressing with thiram and an application of the insecticide thimet prior to planting gave a good stand of plants.

Chilli Powdery Mildew, Leveillula taurica

332. Wettable sulphur at 5 gm/litre and karathane at ½ gm/litre have again given good control of powdery mildew of chilli in a trial at Réduit.

Cucurbit Leaf Spots

333. Following a severe outbreak of downy mildew, *Pseudoperonospora cubensis* (Berk and Curt.) Rostov, on green cucumbers and melon last year, a randomised block trial incorporating maneb, karathane, and a mixture of maneb and karathane as fungicides, was carried out at the College of Agriculture gardens, but no significant results were obtained.

Plant Inspection at Customs and Airport Quarantine

334. Plant Import Permits were issued and 4,060 Certificates of examination were delivered. 548 Phytosanitary Certificates were issued. Ornamental plants, with deficient phytosanitary certificates, were detained pending submission of complete certificates. Plants grown under quarantine included: cowpea, grapevine, potato, maize, bean, tomato, rice and tobacco.

MISCELLANEOUS DISEASES AND FUNGI

335. The following were recorded for the first time in 1963:—

On *Acalypha indica*—powdery mildew—*Odium* sp. probably conidial *Uncinula acalyphae* Tai.

On *Alternanthera sessilis*—fungal leaf spot—*Leptosphaerulina* sp.

On banana fruits—anthracnose—*Gloesporium musarum* Cooke & Massee

On *Bidens pilosa*—rust—*Uromyces bidenticola* Arth.

On Bean—bacterial wilt—*Pseudomonas solanacearum* (E.F.Sm.)

On *Commelyna benghalensis*—rust—*Phakopsora tecta* (Jacks & Holw.)

On *Cynodon dactylon*—rust—*Puccinia cynodontis* Desm.

On *Digitaria pentzii*—rust—*Puccinia oahuensis* Ell. & Ev.

On *Ficus* sp. —leaf spot—*Phyllachora nervisequens* (Ligelsch) Petr.

On *Freesia* sp.—leaf spot—(a) *Alternaria tenuissima* (Nees ex Fr.) Wiltshire, (b) *Venturia* sp.

On *Gardenia* sp.—leaf spot—*Cercospora* sp.

On Guava—leaf spot—*Cercospora sawadae* Yamamoto

On mango—leaf spot—(a) *Pestalotiopsis versicolor* (Sepg.) Stey (b) *Cercospora* sp.

On Pea—wet rot—*Choanephora cucurbitarum* (Berk & Rav.) Thaxter

On *Petunia* sp.—damping off and blight of leaves—*Phytophthora infestans* (Mont.) de By.

On *Polyscias* sp. *(a)* canker—*Elsinoe* sp. probably *E. mulleri* Bittanc & Jenk. *(b)* leaf spot—*Cercospora panacis* Thirumalachar & Chupp

On *Ricinus* sp.—leaf spot—*Cercospora ricinella* Sacc. & Berl.

On squash—scab—*Cladosporium cucumerinum* Ell. & Arth.

On Tea—fructifications of *Armillariella* sp. possibly a small form of *A. mellea.*

On Tobaco—damping off—*Pythium aphanidermatum* (Edson) Fitzp.

On Vegetable marrow—leaf spot—*Pseudoperonospora cubensis* (Berk. & Curt.) Rost.

On *Vicia faba*—leaf, petiole and stem spots—*Cercospora zonata* Wint.

XX. Entomology

Biological Control

336. The predatory snail *Euglandina rosea,* continued to thrive in the release sites of Reduit and Vacoas. About three dozen individuals were collected in the Reduit region and released in small gardens in other localities. The Commonwealth Institute of Biological Control will supply shortly a number of these efficient predators for release in sites offering ideal conditions (warm, humid climate; soil covered with humus and well supplied with snail pests), and from these sites, distribution of the predator throughout the island will be effected. The other predatory snail, *Gonaxis quadrilateralis,* has not been recovered, but it will be tried again for it has been reported to give good results in other tropical countries.

Fruit Flies

337. Consignments of fruit fly parasites, *Opius oophilus, O. longicaudatus* and *Dirhinus giffardii,* from Hawaii were stopped in June, as the Hawaiian authorities could no longer propagate these for Mauritius. However, no recovery of parasites took place during the year and the problem of fruit fly control by biological means remains unsolved. Introduction of parasites from East Africa is under consideration.

Oryctes Rhinoceros

338. One hundred adults and nymphs of the assasin bug, *Platymeris laevicollis,* from Zanzibar were liberated in Diego Garcia during the month of February to prey upon the rhinoceros beetle of coconuts, *Oryctes rhinoceros.*

339. This beetle has gained access into Mauritius and has become well established in one locality near the harbour. The large number of dead coconut trees existing in this region, since the 1960 cyclones, has favoured the development of the beetle by offering ideal breeding sites to the pest. Sanitation consisting of the systematic destruction of all dead logs is in progress in the regions where *Oryctes* is spreading.

340. During the months August-September, *Scolia oryctophaga,* were abundant in the south of the island. 1,215 female and 281 male wasps were collected in this period and liberated in the regions infested with *Oryctes.* Two months later 28 cocoons of the parasite were recovered in manure heaps and dead trunks.

341. The Commonwealth Institute of Biological Control is arranging to obtain the parasite *Scolia ruficornis* and various predators such as *Platymeris, Pheropsophus* sp. and *Scarites* sp.

Potato and Tobacco

342. Attacks of the caterpillars *Plusia chalcites* and *Prodenia litura* on these crops continue to be very severe and very often chemical control remains ineffective, especially in fully grown tobacco fields.

343. In some cases where infestation was intense, the new insecticide telodrin had to be applied, as otherwise no crop would have been obtained. Biological control of these pests is under investigation. On tobacco, the leaf miner, *Gnorimoschema operculella,* was severe in certain localities; the height of the plants impeded the use of insecticides. To obviate this, experiments with a Tifa mist sprayer have commenced; this machine allows the spraying of pesticides over a large area from the sides of a field.

Sugar-Cane

344. The Red Locust, *Nomadacris septemfasciata,* was abundant during the months January—March on sugar-cane in various localities of the island. Damage consisting in 75—90 per cent defoliation was caused by the hoppers which showed a tendency to move towards a gregarious phase. In highly infested fields, aldrin was applied and gave satisfactory control. The use of power sprayers in this campaign confirmed the great advantage of this type of equipment over the conventional sprayers.

345. In some small planters' fields, attacks of the beetle, *Alissonotum piceum,* a sporadic pest of sugar-cane, were reported. Cultural practices were recommended as control measures.

346. The spotted borer, *Proceras sacchariphagus,* was severe in a small planter's field in a humid locality; the development of the pest was favoured by the poor state of the field.

Citrus

347. An unidentified mite, *Acharina,* caused severe deformation of tender shoots and a browning of fruits. Zineb was found to give satisfactory control. The black aphid, *Toxoptera aurantii,* was present throughout the hot season but was easily controlled with either rogor, metasystox or sayfos. Two trouble-

some scales, a *Saissetia* sp., on the twigs and another one on leaves and fruits, were successfully controlled with the new organo-phosphorus insecticide folithion. A white fly, *Aleurodidea,* was intense on lemon trees mainly and caused severe secondary growth of sooty moulds, *Capnodium* sp. by their honey-dew secretions. Rogor gave excellent control. The lepidopterous caterpillars, *Prays citri* and *chloroclystis rubricata,* were very troublesome on the blooms of lemon and caused severe flower drop.

Tomato

348. Rogor continues to give good control of the red spider mite, *Tetranychus evansi.* The tomato fly, *Pardulaspis cyanescens,* and the fruit boring caterpillar, *Heliothis armigera,* were successfully checked by various insecticides such as labaycid, dipterex, DDT and diazinon.

Miscellaneous Pests

349. The thrips, *Heliothrips haemohoidalis,* caused severe defoliation on Indian Almond, *Terminalia catappa,* and on Avocado, *Persea americana.*

350. The mealy bug, *Icerya seychellarum,* which during the past years was very successfully checked by the Agromyzid fly, *Cryptochaetum monophlebi,* is starting to become troublesome again and has been found on litchi, avocado, filao and various ornamental plants. The Entomologist of the Mauritius Sugar Industry Research Institute reports the presence of a Eulophid hyper-parasite, *Tetrastichus* sp., bred from puparia of *C. monophlebi;* this may well account for the unusual recrusdescence of *Icerya.*

351. The scale, *Chrysonphalus ficus,* was very severe on palm trees, *Dictyosperma album,* where coccinellid predators were absent. Two applications of the new insecticide folithion checked the pest.

352. Vine plants from Madagascar in quarantine were attacked by the scale, *Hemiberlesia lataniae.* Repeated applications of typholine B (Oleoparathion) and phosdrin cleared the plants of the pest.

353. Litchi fruits, *Litchi sinensis,* were severely attacked by the fly, *Cryptophebia peltastica,* in the regions of Quatre Bornes and Black River.

354. Coconut tress were sporadically affected by a red spider mite, *Raoiella indica,* and a small delphacid *Nesodryas* sp. Both pests were successfully controlled with systemic insecticides such as rogor, metasystox, ekatin or dimecron.

355. Rose trees and strawberry plants were severely infested with a red mite, *Eotetranychus smithi* Pritchard and Baker. Rogor gave excellent control.

356. The mango stem borer, *Batocera rufomacula,* was again severe on mango and many other trees.

357. Vanda orchids were attacked by a boring beetle, *Zyleborus* sp. Phosdrin gave satisfactory control.

358. A wood boring beetle, *Stromatium barbatum,* caused extensive damage to eucalyptus logs used in the construction of houses.

359. A new fly bait manufactured by CIBA, Nuvan, was found to be extremely efficient against the stable fly, *Stomxys nigra*. The bait contains the insecticide DDVP and is very attractive to flies. In a test near a stable, 20 grams of the bait scattered in a shallow trough killed about 20,000 flies during a week-end.

Equipment

360. A Japanese power sprayer, the KYORITSU, was tested and gave promising results; its main features are light weight and low cost. The TIFA light weight fogging machine is still under test at the Tobacco Warehouses for the control of cigarette beetle. It is also being tested in the field as a mist sprayer for the control of pests on fully grown tobacco.

Insect Collection

361. Systematic collection of insects could not be carried out on account of shortage of staff. The only new species collected was a psocid, *Pseudocaecilius* sp., found in association with a delphacid, *Nesodryas* sp., on coconut and a mite living only on Rosa sp., *Eotetranychus smithi*.

XXI. Agricultural Chemistry

Analyses

362. Some 2,000 samples of various products were analysed for various Divisions of the Department as well as for the public.

Feedingstuffs

363. Raw materials for incorporation into animal feeds at the Livestock Feed Factory were sampled at delivery to the factory and analysed. The analysis of prepared feeds was continued at regular intervals. A special test was done for the content of added manganese in chick feed. It was found to be unevenly distributed throughout. Manganese sulphate was added at the rate of 100 grams per ton of feed. The following was recovered from 3 different samples:—

1. 100 g/ton
2. 110 g/ton
3. 140 g/ton

A feed to which no manganese was added contained 44 grams of manganese sulphate per ton.

Fodder

364. The analysis of imported grasses was continued. The varieties sampled at Curepipe experiment station gave the following results:—

Date cut	*27.12.62*		*31.1.63*		*28.2.63*		*22.11.63*	
Variety	*Dry matter* %	*Protein* % D.M.	*Dry matter* %	*Protein* % D.M.	*Dry matter* %	*Protein* % D.M.	*Dry matter* %	*Protein* % D.M.
Panicum maximum sigor ...	20	9.5	16	9.0	19	13.7	20	9.0
Pennisetum purpureum ...	17	9.8	15	10.4	13	14.0	15	11.9
Chloris gayana (Endebess)	23	8.1	18	7.1	13	14.8	26	10.8
Setaria sphacelata (selected)	14	7.1	13	12.5	12	12.5	15	10.5

Milk

365. The monthly check of the fat content of milk from the Curepipe breeding centre was continued. 485 samples were analysed. The results are tabulated below:—

Fat %	*Below 3*	*3.0–3.4*	*3.5–4.5*	*4.6–5.0*	*Above 5*
Total No. of samples	6	80	340	51	20
%No. of samples : 1963	1.2	16.5	70.1	10.5	1.6
do : 1962	Nil	8.9	79.6	9.5	4.0

Month :		*January*	*February*	*March*	*April*	*May*	*June*	*July*	*August*	*September*	*October*	*November*	*December*
% Samples giving 3.5–4.5% Fat	1963 ...	61.4	72.0	65.3	68	74	68.7	80.8	—	63.3	77.1	70	—
	1962 ...	67	76	70	74.5	74.5	85	80	—	82	82	80	84

In 1963, the fat level of the samples analysed was lower than that of the samples analysed in 1962.

366. Since May, a survey of the quality of the milk throughout the island was started by the Veterinary Services. Milk from small cowkeepers was sampled and forwarded for analysis. The determination of the specific gravity, total solids and fat content was made on 1,091 samples. The analysis was performed at first twice monthly, then twice weekly.

Silage

367. The complete analysis of silage was continued. Samples were obtained from pits in different localities.

Potatoes

368. Different varieties were analysed for their specific gravity and starch content. Below is a comparison for potatoes harvested at Curepipe and Richelieu experiment stations.

	Curepipe	*Richelieu*
Date of planting ...	21. 7.63	29.6.63
Date of harvesting ...	26.10.63	25.9.63

Variety	*Specific gravity*		*Starch%*	
	Curepipe	*Richelieu*	*Curepipe*	*Richelieu*
Pentland Ace	1.061	1.091	12.2	17.5
Delaware	1.051	1.074	11.2	14.3
Kennebec	1.048	1.051	11.5	15.8
King George	1.056	1.080	11.7	15.0
Ackersegen	1.057	—	11.9	—
Susana	—	1.099	—	17.0

XXII. Engineering Division

369. The testing of new agricultural machines was continued. A scum drier was designed and put into operation at the Livestock Feed Factory.

Servicing of Departmental Machinery and Vehicles

370. The servicing and maintenance of all departmental machinery were carried out at the central workshop. Complete service records were kept. The following servicing and repairs were carried out:—

Vehicles	...	...	190
Tractors	...	...	81
Other agricultural machines		...	193
			464

A tractor, a stationary engine and a jeep engine were overhauled.

371. The following equipment and accessories were assembled, fabricated, installed or repaired:—

(a) Assembly of 3 Golden Jubilee incubators, a potato grader. A new Ferguson tractor FE 65 was converted to 4-wheel drive;

(b) Manufacture of 4 steel trailer bodies and one wooden body for lorry;

(c) A Bedford pick-up truck, a tractor, a steel table, water heater and sterilising box were spray-painted. Several trailers and one sign-board were painted;

(d) Manufacture of 10 tables, 3 cupboards, 17 chairs and 5 shelves and renovating of old furniture from Mauritius Government Railways;

(e) Manufacture of canvas hoods for lorry, pick-up and 4 canvas canopies for tractors;

(f) Installation of a stationary engine for irrigation;

(g) Extractor for starter;

(h) Drawbar for Ferguson tractor FE 65;

(i) Seed dresser;

(j) One canopy frame for lorry and 6 for tractors;

(k) Cooling tray for Temkon air cooler;

(l) 625 fencing posts from angle iron and rails;

(m) 10 barbenders;

(n) 30 doors with iron pipes and 12 iron gratings;

(o) Sterilising box for Animal Health Laboratory;

(p) 40 slotted angle iron trays;

(q) Hundreds of foundation and other bolts, hinges, brackets and supports;

(r) Steam cleaning of 500 oil drums.

Buildings

372. The following buildings were completed and handed over:—

1. Store for the Livestock Feed Factory;
2. Greenhouse for Bahnson humidifier;
3. Extension to the offices of the Central Board;
4. Extension to Head Office of the Department of Agriculture.

Work was well advanced at the Roche Bois quarantine station where a goat quarantine, aviary, cattle stalls, goat pen and goat dip were completed.

373. Work on an extension to the Livestock Feed Factory stores was awaiting the Building Plans Committee decision. The corral at Palmar was under construction.

Advisory

374. Lectures on strength of materials, fluid, mechanics, applied thermodynamics and building were delivered at the College of Agriculture.

Manufacture of Yeast Tablets

375. A total of 6,780,000 tablets were manufactured from imported South African yeast powder. Sales of tablets to Government totalled 2,800,000 and 145,000 were bought by the public.

Livestock Feed Factory

376. 4,092 tons of different feeds were manufactured during the year from products such as wheat bran, maize flour, maize, rice, groundnut cake, cotton seed cake, pollard, meat meal, fish meal, oats, lucerne meal, bone meal, code liver oil, skimmed milk powder, molasses, bagasse, wheaten flour, peas, broad beans, scums, beef fat, trelcovite, trelco D 3, trelco brand nitrofurazone, trelco brand nitrofurans, amprolmix U K, nutrigain, T.M. 10 and salt.

377. Fourteen different kinds of animal feeds are now offered for sale, namely: poultry feed, chick feed,cow feed loose, cow feed cubed, calf feed, bull feed, cattle fattening ration, cattle feed, new cattle feed, pig grower feed, pig starter feed, creep feed, horse feed and special horse feed.

378. 4,096 tons of livestock feeds were sold. A statement of revenue and expenditure of the Livestock Feed Factory is given in Appendix " E ".

XXIII. Fisheries

379. The duties of the Division are to enforce the provisions of the law regulating fisheries in territorial waters and to study, recommend and implement such new measures as may be necessary for the better protection of fish. The Division also collects statistical data, takes all steps necessary to improve the efficiency of the industry and the welfare of the fishing community.

Oyster Culture

380. Efforts were made to improve techniques. New types of spat collectors were tried out and from experience it is considered that oyster culture could be extended to areas other than barachois excluding reproduction which should be limited to barachois or adjacent areas.

Construction of Fisheries Posts and Sheds

381. During 1963, the construction of the fisheries posts at Black River and Mahebourg and the fish sheds at La Gaulette and Black River were completed. The construction of a fish shed at Tamarin and a fisheries post at Trou d'Eau Douce is progressing satisfactorily.

Visit of a Fisheries Expert

382. Dr. Henri Fougère, of the Fisheries Research Board of Canada, under the auspices of Canadian Technical Assistance, returned to Mauritius on the 9th of September for an initial period of one year to implement the recommendations of the report that he submitted to Government in 1962.

Sea Fishing

383. Fishing was much better during the year and an increase of 260 tons over 1962 was landed at the controlled landing stations:

Controlled Catch per Quarter (tons)

	Average				
	1951–59	*1960*	*1961*	*1962*	*1963*
1st Quarter	410.5	246.1	451.4	284.2	372.1
2nd Quarter	421.8	375.6	427.7	334.4	436 6
3rd Quarter	335.3	312.2	277.3	257.4	322.2
4th Quarter	434.5	434.3	331.0	339.3	344.0
	1,602.1	1,368.2	1,487.4	1,215.3	1,474.9

384. The total controlled catch was lower by 46 tons than the average for the years 1956-60:—

Year	*Average catch (tons)*	*Difference with the average(1,517)*
1946–50 ...	1,492	−25
1951–55 ...	1,637	+120
1956–60 ...	1,520	+3
1960 ...	1,368	−149
1961 ...	1,487	−30
1962 ...	1,215	−302
1963 ...	1,474	−43

385. The contribution to the catch by the various modes of fishing was as follows:—

Catch in tons

	Average		Catch			
	1951–55	*1956–60*	*1960*	*1961*	*1962*	*1963*
Nets	410	363	418	414	414	396
Basket Trap ...	715	628	492	596	408	567
Lines	247	275	253	248	183	230
Octopii	238	219	177	193	181	237
Lobsters	27	28	18	25	17	25
Harpoon Fish ...	—	7	10	11	12	19
Total	1,637	1,520	1,368	1,487	1,215	1,474

Types of Fish Caught

386. The status of fish species was as follows:—

Species	*Kgs*
Capitaine *(Lethrinus nebulosus)*	34,531
Dame Berry *(Lethrinus mahsena)* ...	63,530
Battardet *(Lethrinus harak)*	37,111
Caya *(Lethrinus reticulatus)*	21,873
Cordonniers *(Siganus* spp.*)*	228,245
Rougets *(Mullus)*	62,642
Mullets *(Mugiloidae)*	47,998
Vieilles *(Senanidae)*	69,606
Licornes *(Naso* spp.*)*	161,070
Octopii	237,267
Lobsters	25,458
Other species of fish	485,649
TOTAL ...	1,474,980

Loans to Fishermen

387. The scheme of loans to fishermen for the construction of boats, which was started in 1960, was completed at the end of 1963. 1,184 loans were granted, including 23 which were written off following destruction of the new boats by the cyclone of February 1962. The total spent from public funds amounted to Rs 499,875. Refund of loans was not satisfactory; a few boats are still under construction.

Detection of Fraud

388. The results of the control excercised by the Inspectorate show an important reduction in the number of contraventions consequent on the activities of the personnel of the division.

Year	*Cases Prosecuted*	*Convictions*	*Total Contraventions*	*Illegal nets*	*Explosives*	*Total of Fines*
						Rs
1953 ...	515	508	550	129	16	16,172
1954 ...	586	571	635	148	44	15,256
1955 ...	473	463	524	110	54	15,036
1956 ...	390	383	436	117	35	11,059
1957 ...	403	396	509	101	30	11,689
1958 ...	429	423	466	115	26	12,360
1959 ...	319	305	421	83	40	10,518
1960 ...	230	229	330	67	23	7,477
1961 ...	248	243	325	100	27	9,971
1962 ...	195	192	270	61	35	4,950
1963 ...	213	199	279	84	22	6,657

In addition, 21 cases were pending at the end of the year.

XXIV. Rodrigues

389. After cyclone Bertha passed over the island in December, 1962, extensive foodcrop plantations were made by the farmers. Cyclone Grace destroyed the promising crop in February, 1963,and it was necessary to replant. Relief work, involving a maximum of 2,000 families, had to be continued to the end of May until the harvesting of foodcrops could commence. A drought from July to November made a mid-season crop impracticable except on valley bottom areas which have been developed for crop production during the last few years. A record crop of onions was harvested from August to October. In December, 1963, cyclone Amanda hit the island and, at the end of the month, very promising foodcrop plantations were visible throughout the island although fruit and vegetable crops were practically unavailable. Due to the poor mid or second season crop, relief work was started in November and about 1,200 people were employed. Relief work consisted of 10 days work per fortnight, 2 days being paid in cash and 10 days paid in maize at a rate of 10 lbs per day.

390. The standard of animal husbandry practised by the small farmer continued to rise, notably the keenness to adopt the stall feeding of bullocks and milch cows. A record number of pigs were exported and the quality of animals exported also improved. Overstocking on the free grazing of the cattle walk pastures was once more in evidence although there is a trend to reduce the number of cattle on the cattle walk.

391. The housing of farmers was improved, due in large measure to the assistance given to rebuild houses blown down by cyclones. The improvement of farm water supplies for irrigation and domestic use continued.

Production and Marketing

392. The m. v. " MAURITIUS " made 12 trips to Rodrigues and the following table gives the exports from the island on each occasion:—

Date	*Cattle*	*Sheep and Goats*	*Fowls*	*Pigs*	*Bags of Onions and Garlic*	*Acacia*	*Bales of salt Fish*	*Bales of Octopus*
5. 1.63 ...	2	381	8	100	1	8	105	37
6. 2.63 ...	26	530	23	297	1	98	200	75
16. 3.63 ...	—	217	14	15	—	—	313	—
7. 4.63 ...	77	438	59	438	—	30	509	—
11. 5.63 ...	54	425	62	267	—	28	426	141
20. 6.63 ...	40	481	85	335	—	103	248	142
18. 7.63 ...	35	401	63	373	—	314	174	110
14. 9.63 ...	211	741	112	584	176	242	392	213
10.10.63 ...	—	148	20	124	82	—	202	—
2.11 63 ...	65	656	78	544	1,544	482	292	131
20.11.63 ...	—	212	56	151	503	—	150	20
21.12.63 ...	69	1,124	126	314	1,124	—	146	79
TOTAL ...	579	5,754	706	3,542	3,431	1,305	3,157	948

These figures were obtained from the records kept by the Stevedore responsible for transporting the cargo from jetty to the ship.

An approximate valuation of these exports is:—

	Rs
579 cattle at Rs 250 each	144,750
5,754 sheep and goats at Rs 40 each ...	230,160
706 crates poultry 36 head per crate, 2 lbs each at Rs 1.75 per lb ...	111,322
286 tons onions at Rs 400 per ton ...	114,400
3,542 pigs at Rs 90 per head	318,780
130 tons acacia seed at Rs 460 per ton ...	59,800
3,157 bales salt fish 140 lbs per bale at Rs 90 per lb	397,782
948 bales octopus 140 lbs per bale at R. 1 per lb	132,720
TOTAL ...	1,509,714

393. The following table compares the total exports as from 1960:—

	1960	*1961*	*1962*	*1963*
Cattle	615	720	1,076	579
Sheep and goats ...	6,133	5,654	5,963	5,754
Poultry, crates ...	728	650	636	706
Pigs	2,908	2,258	2,858	3,542
Onions and garlic, tons	258	150	51½	286
Acacia, tons	235	75	38	130
Salt fish, bales ...	2,712	2,450	2,800	3,157
Octopus, bales ...	1,475	1,090	1,570	948

394. It is to be regretted that more cattle were not sold off the island as the cattle walk is still overstocked. The competition presented by Madagascar imports into Mauritius and the marketing organisation of cattle in Mauritius is responsible for this, along with a certain reluctance of local owners to sell, as many still regard their cattle on the walk as money in the bank. Over the last few years, there has been an increase in the number of cattle killed by local butchers. The increase in poultry and pigs is most encouraging particularly, as with cattle, more are being killed for local consumption year by year, The export of pigs reached an all time record and prices were maintained. One pig buyer is selling whole carcases of Rodriguan pigs to the Mauritius Cold Store and also making packaged pork chops. This is a good development which reflects the improvement which has been made in the quality of the animal sold due to introduction of Berkshire blood and improved housing and feeding. The record onion crop is due in large measure to the development work opening up the valley bottoms for intensive cultivation along with improved farm water supply and the controlled spraying against thrips by the divisional spraying teams. The fishery exports are derived mainly from within the lagoon. No development work has yet been undertaken in fisheries.

Land Development and Settlement

395. One of the main objects of the development work in Rodrigues is to settle families on farms which have been prepared to control soil erosion and support a number of livestock to ensure adequate production of manure, milk, cash crops and small livestock for cash sale plus a subsistence food supply. Most of the island consists of steep slopes and originally the majority of the population did not live on the land they farmed; often their crop land was 2 or 3 miles away from the homestead.

396. At present, the island is divided into ten agricultural districts with a Rodriguan overseer in charge of each. The type of land development is divided into three types according to the land potential. On the steep slopes, the basic requirement is a terraced land protected from above and below by catchment drains. Terracing is an art which has now been adequately mastered by the Rodriguan provided he works under supervision and the levels are set on his land by the overseer who is now trained in levelling. The actual work is done by contracting out to farmers and pay is made on the satisfactory completion of the work. The first step in the technique is for the overseer and assistants to survey the land and mark the contours. Next the contractor digs canals along these contours, throwing the earth uphill—usually a 2 feet × 2 feet canal is cut at a rate of about 12 cents per foot, normally 1 acre has 2,000 feet of such canal and this part of the operation costs Rs 240 per acre. Next stones are collected and carried on to the field to build the terrace walls. The walls are usually 3 feet in height as the vertical interval of canals is from 2 feet to 4 feet. These stones cost at most Rs 3 per cubic yard and 1 cubic yard provides 9 feet of 3 feet high terrace, therefore stones cost $2000/9 \times 3 =$ Rs 660 per acre. The third step is to build the actual terrace and this costs 5 cents per sq. ft. The terrace is usually 3 feet high, therefore each farm requires $2,000 \times 3 = 6,000$ sq. feet per acre costing Rs 300 per acre. The total cost of this terracing operation plus Rs 240 per acre for the protective storm canals averages out at Rs 1,500 per acre. In places where stones for walling are not available, the canals are grassed down. Ideally, every third terrace is planted to grass for fodder for feeding to a cow or bullock kept in a shed. Each family unit must have about 2 acres and it is possible for such a family farm to produce at least 1 fat bullock per year and 2 fat pigs and some poultry; also some cash crop in the form of beans, onions or garlic. It is essential however to get water piped on to the farm in order to build up this production. Manure which is an essential on the eroded soils is produced in excess by this form of settlement and will ensure a future build up in fertility and production.

397. The second tpye of land development concerns mainly the cattle walk areas which account for about half of the island's 26,000 acres but which are at present practically uninhabited, providing open grazing for 4,000 to 5,000 scrub cattle owned mainly by a few people. The settlement of these areas is designed to make 4 acre family farms, each farm consisting of 3 acres grass and 1 acre of terraced land for intensive cash and foodcrop production. Experience has shown that, if the 3 acres of grass are paddocked into 12 quarter acre paddocks and planted to Pangola grass, it is possible to provide for 2 cows in milk with one heifer follower. One important cash product of these farms will be butter and ghee. Two milk cows in production can produce 3,650 lbs of milk per year. 1 bottle of ghee with a retail value of Rs 5.00 can be produced from 30 lbs of milk; an income of Rs 600 per year from ghee alone may be anticipated, the skim milk to be used for pig fattening and/or human consumption. These milk returns plus cash crops of beans, onions etc., and poultry and pigs could provide a satisfactory income for the family. Here again the technique of development makes full use of the Rodriguan farmer's

ability as a dry stone wall builder and hand hoer. The cost of developing such a 4 acre farm is as follows:—

	Rs
Walling of 3-acre paddock in ¼ acre units and 1 acre terraced land 3,800 feet at 50 cents per foot	1,900
Planting, hoeing etc. 3 acres improved grass at Rs 600 per acre	1,800
Terracing 1 acre of land	1,500
600 lbs of N.P.K. fertilizer	180
TOTAL	5,380

398. The third type of development is carried out on the numerous valley bottom lands which consist of alluvial soils. Development of these areas is mainly a problem of canalising the flow of flood waters and terracing the land between the high velocity discharge canals constructed to take the flood waters. Several methods of constructing such canals have been tried and one which holds the most promise consists in building stone wall "sausages" enclosed in 6" mesh chain link fencing. These sausages may be made in any desired diameter and offer an immovable barrier to flood waters. The valley bottoms have also a perennial supply of water.

399. These settlements when completed are leased out to farmers either as Unit Farms, in which case the accurate acreage of the farm is not stated on the lease due to the difficulty of measuring accurately on steep slopes, or as Lowland Farms in which case the actual acreage of land is stated on the lease, or as Vegetable Plots which are ⅛ acre in extent and situated on valley bottom land.

400. At the close of the year, 1,200 Vegetable Plots, 702 Lowland Farms and 1,150 Unit Farms were leased. 10 Dairy Farms were nearing completion and will be leased in 1964.

REAFFORESTATION

401. During the year, seven tree nurseries were laid down at the following sites: Port South East, Le Chou, Roche Bon Dieu, Mangue, Baie Topaze, Marechal and Citron. At the close of the year, 500,000 tree seedlings, mainly filao, were ready for planting. The object of this work is protective in that plantings are made on steep, exposed slopes and hilltops. During the year, 200 acres of such land was planted under protective forest.

FARM WATER SUPPLIES

402. Intimately connected to the above schemes of settlement is the provision of an adequate farm water supply. The island is relatively rich in good small springs but these are mainly at the 300 feet to 600 feet contour level in steep sided valleys. The experience gained shows that by building small dams and lifting the water 300 to 400 feet into suitable storage tanks, distribution to farms can thus be effected, greatly increasing the production of the farms in both crops and livestock. The problem of farm water supply is simply one of collection from springs, pumping to a maximum of 400 feet and then distributing from the storage tanks. At the close of the

year, a total of 24 dams and 11 storage tanks had been completed along with one pumping station near Citronelle. Pumping stations at Bigarade and Grande Montagne will be completed in early 1964. A total of 120,000 feet of galvanised water pipe was laid.

Demonstration Plots

403. Demonstration Unit Farms were maintained at Le Ferme, Mangue, Marechal, Citron Denis, Latanier, L'Eau Clair, Palisade, Boule and Roche Bon Dieu and Trois Soleils. They were regularly visited by farmers during the year.

Livestock Breeding Centres

404. The six centres were maintained and second calved cows in milk, young bullocks and weaned pigs were sold to farmers. Total sales have been as follows:—

Year	Dairy Cattle		Pigs		Young Male
	Adult Female	Young Male	Adult Female	Young Female	
1958 ...	1	1	—	—	13
1959 ...	7	3	—	5	35
1960 ...	39	61	6	74	135
1961 ...	38	66	1	178	220
1962 ...	34	65	22	341	329
1963 ...	37	98	6	314	315

405. One of the larger cattle owners offered to sell some of his young calves during the dry season. The calves were in poor condition but a trial purchase of 63 was made, 13 of which died, the remainder are now in good condition and will be resold to small farmers for fattening.

406. The number and distribution of the Government herd at the end of the year were:—

Centre	Dairy Cattle				Total
	Adult		Young		
	Male	Female	Male	Female	
Oyster Bay ...	2	10	7	26	45
Malabar ...	1	15	18	43	77
Le Chou ...	1	28	13	21	63
St. Gabriel ...	1	23	7	44	75
Maréchal ...	1	15	7	30	53
Baie Topaze ...	2	29	9	11	51
Lataniers ...	—	—	—	2	2
Trois Soleils ...	—	—	—	4	4
Mt. Govave ...	2	—	—	7	9
Mangues ...	—	—	—	2	2
La Ferme ...	—	—	—	2	2
Brule	—	—	—	2	2
Corail	—	—	—	2	2
Citron	—	—	—	2	2
Mangues Dairy Farm	—	—	—	2	2
Pt. Coton ...	4	—	—	7	11
Baie Malgache ...	—	—	—	6	6
TOTAL ...	14	120	61	213	408

407. *Rearing-Breeding Record—Dairy Cows:—*

Centre	*No. of Calvings*	*No. of Calves*		*Bought in from farmers*		*Deaths*			
		M	*F*	*M*	*F*	*MA*	*FA*	*MY*	*FY*
Oyster Bay ...	15	8	7	3	4	1	3	1	—
Malabar	22	17	5	9	4	—	3	2	3
Le Chou	31	23	8	4	4	1	—	3	2
St, Gabriel	18	6	12	4	1	—	—	2	1
Marechal	16	4	12	6	4	1	—	1	3
Topaze	20	15	5	7	2	1	3	—	—
TOTAL ...	122	73	49	33	19	4	9	9	9

It is unfortunate that out of the total of 174 calvings in centres and on farmers' farms a higher proportion of male calves was produced, 106 males and only 68 females. In 1962, there was exactly the same number of calvings with the proportion of 94 males to 80 females.

408. Pigs:—

Centre	*Adults*		*Young*		*Total*
	Male	*Female*	*Male*	*Female*	
Oyster Bay	2	13	12	15	42
Le Chou	2	19	7	16	44
St. Gabriel	2	14	14	11	41
Marechal	3	14	3	9	29
Baie Topaze	2	19	35	43	99
Pt. Brule	1	3	5	4	13
Lataniers	—	—	—	4	4
Mangues	—	—	—	2	2
	12	82	76	104	274

409. Rearing and Breeding Record—Pigs:—

Centre	*No. of Farrowings*	*Born*		*Died*				*Culled*	
		M	*F*	*M. A.*	*F. A.*	*M. Y.*	*F. Y.*	*M. Y.*	*F. Y.*
Oyster Bay ...	17	61	74	—	2	12	13	—	—
Le Chou ...	29	91	103	—	1	8	5	6	3
St. Gabriel ...	23	105	81	—	2	26	11	6	—
Marechal ...	15	39	46	—	—	1	5	—	—
Baie Topaze ...	22	91	90	—	1	10	—	1	—
Pt. Brule ...	5	13	24	—	—	1	—	—	—
	111	400	423	—	6	58	34	13	3

The average size of litter was therefore 7.4 piglets per farrowing and there was an 86 per cent survival to weaning. At the start of the year, there were 62 breeding sows, a potential of 124 farrowings, 20 gilts farrowed during the year and 6 sows died. Therefore, out of a potential of 132 farrowings, 111 were achieved and 21 were missed.

410. Sheep:—

Centre	Adults		Young		Total
	M	F	M	F	
Gombrani Island ...	1	7	8	23	39
Mangue	1	6	2	7	16
Ft. Cotton	1	—	—	—	1
	3	13	10	30	56

411. Rearing and Breeding—Sheep:—

Centre	Births		Died		Sold
	M.Y.	F.Y.	F.A.	M.Y.	M.Y.
Gombrani Island ...	15	8	2	1	13
Mangue	2	3	—	—	
	17	11	2	1	13

Lagoon Islands

412. A flock of sheep was kept on Gombrani island during the year. Coconuts of the Malayan Dwarf Variety were planted on this island. In the second half of the year Ilot Chat was taken over by the Department, and later Ilot Cocos and Ilot Sables. At the end of 1963, it is also proposed to take over Ilot Crabes. The object is to control fire on these islands, plant coconuts and harvest acacia seeds for the government herd.

Cattle Walk

413. A cattle census was taken in March 1963:—

Year	Bulls	Bullocks	Cows	Calves	Total
1961 ...	793	260	3,354	1,537	5,444
1962 ...	696	281	2,890	955	4,822
1963 ...	764	234	2,585	978	4,561

The shade tree plantations were maintained and the development of pangola paddocks for dairy farming continued.

XXV. Lesser Dependencies

414. Four principal groups of islands were concerned namely Peros of 2,900 acres, Salomon of 2,000 acres, Diégo Garcia of 6,000 acres and Agaléga of 6,000 acres. The islands produce copra and yields are low.

415. The islands continued to be operated by a Seychelles company. No visits were paid to them during the year under review. One hundred adults and nymphs of the assassin bug, *Platymeris laevicollis*, from Zanzibar, which feeds on adults and larvae of *Oryctes rhinoceros* were despatched in February and liberated in Diégo Garcia. *Scorites dubiosus*, another predator of *Oryctes rhinoceros* did not thrive in Mauritius; in consequence this predator was not despatched to Diégo Garcia.

APPENDICES

A. Staff

(as at 31st December)

Appointment	Name	Remarks
Director of Agriculture	M. D. ffrench-Mullen, ... D.I.C.T.A., A.I.C.T.A.	Returned from overseas leave on 16.10.63
Deputy Directors (2) ...	S. Staub, A.R.C.S.T. (Glas.), A.M.I.Mech.E., Dip. Agric. (Maur.)	
	A. Darné, F.R.C.V.S., ... Dip. Agric. (Maur.)	Went on overseas leave on 7.10.63 B. D. Roy acting
Administrative and Finance Divisions		
Chief Finance Officer ...	L. Hennequin	Went on overseas leave prior to retirement on 29.4.63 L. Allier acting
Chief Executive Officer	S. W. Toolsy	
In addition there are:—		
	3 Senior Executive Officers	
	5 Executive Officers	
	2 Higher Clerical Officers	
	13 Clerical Officers	
	1 Senior Stores Officer	
	1 Assistant Stores Officer	
	2 Stores Assistants ...	1 vacancy
	1 Confidential Assistant	
	8 Typist/Stenographers	
	1 Librarian	
Agricultural Division		
Senior Agricultural Officers (3)	B. D. Roy, B.Sc. Agri. (Wales), Dip. Agric. (Maur.)	Returned from leave on 5.8.63
	K. Lutchmeenaraidoo, B.Sc., Agric. (Read.), Dip. Agric. (Maur.)	
	1 vacancy	

Appointment	Name	Remarks
Agronomists (3) ...	L. A. Suzor, Dip. Agric. (Maur.)	
	J. Seeyave, A.I.C.T.A. (Trinidad), Dip. Agric. (Maur.)	
	1 vacancy	
Horticulturist ...	J. H. Julien, Dip. Agric. (Maur.)	
Agricultural Officers (9)	P. Regnard	
	J. Marot	
	I. Fakim, Dip. Agric. (Maur.)	
	D. Lalji	
	M. Sooltangos, Dip. Agric. (Maur.)	
	H. Choolun, Dip. Agric. (Maur.)	
	A. Ferrière	Went on study leave on 24.8.63
	S. Bagwant	
	1 vacancy	

In addition there are:—

17 Assistant Agricultural Officers
1 Surveyor
1 Assistant Surveyor
18 Overseers ... ... 3 vacancies

Agricultural Chemistry Division

Chemist	S. Belcourt, B.Sc. (Wales), Dip. Agric. (Maur.)	
Assistant Chemist ...	J. Pablot	

In addition there are:—

3 Scientific Assistants

Plant Pathology Division

Plant Pathologist ...	L. Orieux, B.Sc. (Lond.) D.I.C.	
Assistant Plant Pathologist	S. Félix, Dip. Agric. (Maur.) ...	Returned from overseas leave on 9.12.63

In addition there are:—

4 Quarantine Inspectors
1 Scientific Assistant

CENTRAL BOARD DIVISION

Appointment	Name	Remarks
Registrar	P. J. Galéa, Dip. Agric. (Maur.)	Returned from overseas leave on 2.7.63
Assistant Registrar and Chief Chemist	Y. Wong You Chong, ... B.Sc. (1st Class Hons.) Chemistry, B.Sc. (1st Class Hons.) Agricultural Chemistry	Appointed 27.6.63
Accountant	J. G. Gnany, A.A., C.C.A.	
Senior Assistant Chemist	I. D. Nawoor, B.Sc. (Hons.) Chemistry (Wales)	Appointed 11.12.63
Assistant Chemist ...	R. Thélémaque, Dip. Agric. (Maur.)	
In addition there are:—		
	1 Investigational Officer & Weighbridge Inspector	
	3 Senior Test Chemists ...	1 vacancy
	18 Test Chemists ...	7 vacancies
	7 Test Chemists ...	Employed during crop only
	25 Samplers ...	Employed during crop only

AGRICULTURAL COLLEGE DIVISION

Principal	E. Limfat, M.Sc., M.A.S.A.E., A.M.I. AGR.E., B.Sc., A.C.G.I., A.M.I., Chem. E.	Appointed 13.8.63
Lecturers (4)	R. Latulipe, B.Sc. (Lond.)	
	R. Burrenchobay, B.Sc. (Edin.)	
	M. Pérombelon, M.Sc. (Aberdeen) B.Sc. (Hons.) Aberdeen, Dip. (Hons.) Agric. (Maur.)	Appointed 2.12.63
	S. Moutia, B.Sc (Hort.), Dip. Agric. Econ. (Oxon), Dip. Agric. (Maur.), F.R.H.S.	Went on study leave on 15.7.63 J. Seeyave acting
Assistant Lecturers and Laboratory Demonstrators (4)	P. Guérandel, Dip. Agric. (Maur.)	
	F. G. Carver, Dip. Agric. (Maur.)	
	S. Boojeedhur, Dip. Agric. (Maur.)	Appointed 1,4.63
	1 vacancy	

ENGINEERING DIVISION

Appointment	Name	Remarks
Agricultural Engineer ...	Vacant	M. Morad acting
Assistant Agricultural Engineer	M. Morad, Dip. Agric. (Maur.)	
In addition there are:—		
	1 Scientific Assistant ...	On study leave
	1 Supervisor, Livestock Feed Factory	
	1 Accounts Clerk	
	1 Temporary Clerk, Extension Shop	

ENTOMOLOGY DIVISION

Entomologist	J. E. A. Orian, B.Sc., F.R.E.S., F.Z.S., Dip. Agric. (Maur.), A.C.R.	On study leave
Assistant Entomologist	J. Monty, Dip. Agric. (Maur.)	Acting as Officer-in-charge, Entomology Division
In addition there is:—		
	1 Scientific Assistant ...	On study leave

DIVISION OF VETERINARY SERVICES

Senior Veterinary Officer	J. U. D. Shuja, M.R.C.V.S.	Returned from overseas leave on 11.11.63
Veterinary Officers (2)	D. Koerner, Dr. Med. Vet. (Hanover)	On contract.
	1 vacancy	
Animal Husbandry Officer	J. A. C. Delaitre, B.Agr. (N.Z.) Animal Husbandry	Returned from overseas leave on 14.10.63
Laboratory Technologist	L. Webb, A.I.M.L.T. (Lond.) Dip.Biol. (Lond.), M.I.Biol. (Lond.)	
Senior Stock Inspectors (2)	J. H. Avice	
	R. Pascal	Appointed 1.7.63
Agricultural Officer (Poultry)	Clifford Gassin, N.D.P.H.	
In addition there are:—		
	1 Scientific Assistant	
	7 Stock Inspectors	
	21 Livestock Assistants ...	3 vacancies

Tea Division

Appointment	Name	Remarks
Senior Agricultural Officer	D. N. Andrews	On contract. Returned from overseas leave on 17.6.63
Agronomist	L. Moorlee, Dip. Agric. (Maur.)	
Agricultural Officer ...	A. Baissac, Dip. Agric. (Maur.)	Returned from overseas leave on 16.9.63
In addition there are:—		
	4 Assistant Agricultural Officers	
	5 Overseers	(1 permanently seconded to Midlands Tea Estate, N.E.T.E. Co.)
		2 vacancies

Fisheries Division

Fisheries Officer ...	J. de B. Baissac	
Chief Inspector ...	J. Momplé	Returned from overseas leave on 7.10.63
In addition there are:—		
	3 Inspectors	
	3 Sub-Inspectors	
	16 Head Guards	
	36 Guards	2 vacancies

Rodrigues Division

Senior Agricultural Officer	P. L. Hotchin, O.B.E., B.Sc. Agr. (Leeds), D.T.A. (Trinidad)	
Agricultural Officer ...	E. Farla	
In addition there are:—		
	2 Assistant Agricultural Officers	2 vacancies
	10 Overseers	
	1 Executive Officer	
	1 Stores Assistant	
	4 Clerical Assistants	

B. Composition of the Principal Boards and Committees

(i) Board of Agriculture, Fisheries and Natural Resources

Ex-Officio Members

The Director of Agriculture—*Chairman*
The Conservator of Forests—*Vice-Chairman*
A Deputy Financial Secretary

Members of the Legislative Council

Dr. the Honourable L. R. Chaperon
The Honourable K. Jagatsingh
The Honourable R. Rey
Dr. the Honourable L. Teelock

Representatives of Millers

Mr. Robert Doger de Spéville
Dr. P. O. Wiehé, C.B.E.

Representatives of Planters

Mr. G. Rouillard
Mr. Hassam Nazroo

Representative of the Chamber of Agriculture

Mr. L. H. Garthwaite

There were 3 meetings of the Board during the year.

(ii) Agricultural College Advisory Board

The Director of Agriculture—*Chairman*

Nominated by His Excellency the Governor

The Honourable R. Balgobin
Mrs. V. Teeluck, B.A.
Dr. P. O. Wiehé, C.B.E.

Nominated by the Chamber of Agriculture

Mr. Lucien de Chazal—resigned and replaced by Mr. Roger Bax as from May
Mr. André Raffray, Q.C.—resigned and replaced by Sir André Nairac, Q.C., C.B.E. as from August

Nominated by the Société de Technologie Agricole & Sucrière

Mr. P. de Sornay, Officier de la Légion d'Honneur
Mr. Auguste Harel

Nominated by the Association of Former Agricultural Students

Mr. René Noël

The Board held 4 meetings during the year.

(iii) CENTRAL BOARD

Mr. Magistrate S. Mootoosamy—*Chairman*

Representatives of Millers

Mr. Robert de Spéville
Mr. Francis North Coombes

Representatives of Large Planters

Mr. Roland Ducler des Rauches
Mr. Baalkrishna Ramphul

Representatives of Small Planters

Mr. P. Dabee
Mr. Jagdeosing Chundunsing

The Board held 18 meetings during the year.

(iv) TOBACCO BOARD

Ex-Officio Members

The Director of Agriculture or any officer of his Department deputed by him—*Chairman*
The Commissioner of Excise—*Vice-Chairman*
The Accountant General or any officer of his Department deputed by him
The Manager, Tobacco Warehouse

Appointed by His Excellency the Governor on the advice of the Minister

The General Manager of the British American Tobacco Co. (Mauritius) Ltd., or his representative
The Managing Director of the Amalgamated Tobacco Corporation (Mauritius) Ltd,. or his representative
Mr. A. G. Rey
Mr. P. Jheelan
Mr. R. Ducler des Rauches
Mr. R. Ramchurn

The Board held 13 meetings during the year.

(v) LAND SETTLEMENT ADVISORY COMMITTEE

The Director of Agriculture or his representative—*Chairman*
The Senior Agricultural Officer (Extension)
The Registrar of Co-operative Societies
The Civil Commissioner (North)
The Civil Commissioner (South)
The Civil Commissioner (Moka—Flacq)
The Civil Commissioner (Plaines Wilhems—Black River)
The Honourable R. Balgobin
Mr. Hassam Nazroo
Mr. Hurruck Hoolsy

The Committee held 4 meetings during the year.

(vi) Tea Control Board

Ex-Officio Members

The Director of Agriculture—*Chairman*
The Deputy Financial Secretary (Economics)

Members appointed by His Excellency the Governor

Mr. P. Boullé
Mr. J. Pilot
Mr. R. Ramdin
Mr. A. H. Maderbocus
Mr. B. Ramsahye
The Honourable V. Govinden, M.B.E.
The Honourable Y. Ramjan
Mr. F. North Coombes

The Board held 12 meetings during the year.

(vii) Sugar Planters' Rehabilitation Fund Committee

Ex-Officio Members

The Director of Agriculture—*Chairman*
The Registrar of Co-operative Societies

Members appointed by His Excellency the Governor

Mr. C. Dwarkasingh
Mr. J. Lagesse
Mr. S. Narain
Mr. J. Roodurmun
Mr. G. Rouillard

The Committee held 16 meetings during the year.

C. Legislation

Proclamation No. 8 of 1963	...	To proclaim the rate of the duty leviable under the Central Board (Costs of Administration) Ordinance, 1951, on the sugars of the 1962 crop exported from the colony.
Proclamation No. 20 of 1963	...	To provide for the treatment of a Coconut Trees Disease.
Proclamation No. 29 of 1963	...	To authorise the use of large nets for fishing during the period extending from the 1st November, 1963 to the 31st January, 1964.
Ordinance No. 18 of 1963	...	The Ministry of Agriculture and Natural Resources (Integration) Ordinance, 1963.
Ordinance No. 27 of 1963	...	The Fisheries (Amendment) Ordinance, 1963.
Ordinance No. 35 of 1963	...	The Cyclone and Drought Insurance Fund (Amendment) Ordinance, 1963.
Ordinance No. 37 of 1963	...	The Tea Industry Control (Amendment)
Ordinance No. 38 of 1963	...	The Mauritius Agricultural Marketing Ordinance, 1963.
Ordinance No. 40 of 1963	...	The Tobacco Board Employees' Provident Fund Ordinance, 1963.
Govt. Notice No. 31 of 1963	...	The Pensions Ordinance, 1951.
Govt. Notice No. 43 of 1963	...	The Civil Establishment Ordinance, 1954.
Govt. Notice No. 47 of 1963	...	Regulations made by the Minister after consultation with the Tea Control Board under Section 16 of the Tea Industry Control Board Ordinance, 1959.
Govt. Notice No. 63 of 1963	...	The Tea Industry Control Ordinance, 1959.
Govt. Notice No. 76 of 1963	...	The Cyclone and Drought Insurance Fund Ordinance, 1957.
Govt. Notice No. 77 of 1963	...	The Cyclone and Drought Insurance Fund Ordinance, 1957.
Govt. Notice No. 82 of 1963	...	The Tea Industry Control Ordinance, 1959.
Govt. Notice No. 85 of 1963	...	The Tea Industry Control Ordinance, 1959.
Govt. Notice No. 100 of 1963	...	The Pension Ordinance, 1951.

D. List of Publications and Contributions to Literature by Officers of the Department of Agriculture during 1963

Name of Author	*Title of paper*	*Name, Volume No., Page Nos. of Periodical in which published*
Orieux, L. & Félix, S.	Plant Diseases and their control in Mauritius	Bulletin No. 95
North Coombes, A. ...	The Royal Botanical Gardens, Pamplemousses	Revue Agricole et Sucrière de l'Ile Maruice, Vol. 42, No. 1 pp. 36–41
Herchenroder, M. ...	Statistical Review of the Tea Contractual Year	Revue Agricole et Sucrière de l'Ile Maurice, Vol. 42, No. 1 pp. 41–48
Delaitre, C.	L'Alimentation des animaux domestiques	Revue Agricole et Sucrière de l'Ile Maurice, Vol. 42, No. 1 pp. 49–53
Orieux, L. & Félix, S....	Notes sur une maladie cryptogamique des piments et poivrons à l'Ile Maurice	Revue Agricole et Sucrière de l'Ile Maurice, Vol. 42, No. 2 pp. 134–136
North Coombes, A. ...	Apercu de l'évolution de l'agriculture à l'Ile Maurice	Revue Agricole & Sucrière de l'Ile Maurice, Vol. 42, No. 4 pp. 225–233
Orian, J.E.A.	Les insectes et la lutte biologique	Revue Agricole & Sucrière de l'Ile Maurice, Vol. 42, No. 4 pp. 243–246
Félix, S. & Orieux, L....	Charcoal Stump Rot, a root disease of tea plants in Mauritius	Revue Agricole & Sucrière de l'Ile Maurice Vol. 42 No. 4 pp. 247–248
Webb, J.L., Nadeau, F. & Maurice, R.	Notes on ticks and fleas of the dog in Mauritius and on their control by the oral administration of an insecticide	Revue Agricole & Sucrière de l'Ile Maurice, Vol. 42 No. 4 pp. 263–266

E. Richelieu Livestock Feed Factory

STATEMENT OF REVENUE AND EXPENSES FOR THE YEAR ENDED 30TH JUNE, 1963

EXPENSES	Rs c	Rs c	Rs c
Stock of materials on 1.7.62:—			
Raw materials	420,928.45		
Less Amount not paid in 1961–62	151,322.92		
		269,605.53	
Manufactured feeds		10,108.35	
Aloe bags		5,381.25	
			285,095.13
Purchase of raw materials and bags:—			
Maize		691,130.86	
Wheat bran		270,439.06	
Pollard		166,601.87	
Ground nut cake		108,068.67	
Lucerne meal		81,064.05	
Meat meal		134,343.40	
Colonial salt		3,714.75	
Oats		89,236.11	
Bone meal		18,946.40	
Cod liver oil		35,693.45	
Milk powder		23,750.00	
Wheaten flour		3,015.00	
Molasses		39,710.75	
Rice sweeping		295.20	
Cotton seed cake		66,673.19	
Baled bagasse		1,272.79	
Fish meal		68,652.75	
Beef fat		652.00	
Vitamin		19,994.05	
Antibiotic		2,679.26	
Aloe bags		80,065.00	
			1,905,998.61
Wages		75,376.53	
Transport		1,189.48	
Office expenses		147.50	
Electricity		7,084.44	
Insurance		1,230.93	
Maintenance of machinery and lorry		9,730.95	
Rent of extension shop		2,400.00	
			97,159.83
Net profit			42,498.20
		TOTAL ...	2,330,751.77

REVENUE	Rs c	Rs c
Sale of feeds		1,821,346.16
Stock of materials on 30.6.63:—		
Raw materials	473,165.91	
Less Amount not paid in 1962–63	2,745.00	
		470,420.91
Manufactured feeds		18,884.70
Aloe bags		20,100.00
TOTAL ...		2,330,751.77

F. Conversion Table

1 Arpent	1.043	acres
1 Gaulette	10.6	feet
1 Metric Ton	1,000	kilos
1 Long Ton	1,016	kilos
1 Pound avoirdupois	454	grams
1 Kilo	1,000	grams
1 Hundredweight	50.803	kilos
1 Cord	92.82	cubic feet
1 Imperial gallon	4.54	litres
1 Rupee	1/6	sterling

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